BEFORE THE ARIZONA CORPORATION COMMISSION

ORIGINAL

COMMISSIONERS
BOB STUMP-Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF THE APPLICATION OF COMMUNITY WATER COMPANY OF GREEN VALLEY FOR AUTHORITY TO BORROW UP TO $3.4 MILLION FROM COMPASS BANK AND COMPASS MORTGAGE CORPORATION FOR THE PURPOSES OF (1) REFINANCING UP TO $2.2 MILLION IN EXISTING LONG-TERM DEBT; AND (2) ISSUING AN ADDITIONAL $1.2 MILLION IN LONG-TERM DEBT, UNDER A.R.S. §§ 40-301 AND 40-302.	DOCKET NO. W-02304A-14-0041 **COMMUNITY WATER COMPANY AUGUST 14, 2014 RESPONSE TO STAFF JULY 31, 2014 REPLY**

Community Water Company of Green Valley ("CWCGV") submits its Response to Staff's July 31, 2014 Reply.

A. Staff's denial of the financing is an impermissible interference with the management of CWCGV; the Company's request meets the requirements in A.R.S. § 40-301(C).

Staff was to address several questions posed in the Procedural Order issued on July 11, 2014. Staff's Reply, however, provides no new information and fails to justify denial of financing for the new 2.0-million gallon aboveground steel storage tank ("Storage Tank"). Put simply, Staff's analysis and recommendation ignores the standard set forth in A.R.S. § 40-301(C).

In fact, Staff's recommendation interferes with the management prerogative of CWCGV. The management interference doctrine is a judicial construct designed to protect regulated corporations from over-reaching and micro-management of their internal affairs by the Commission. *Miller v. Arizona Corp. Comm'n,* 227 Ariz. 21, 27, ¶ 23, 251 P.3d 400, 406 (App. 2011). A public utility may, in the first instance, in the exercise of its managerial functions, determine the type and extent of service to the public within the limits of adequacy and reasonableness. *Southern Pacific Co. v. Arizona Corp. Comm'n*, 98 Ariz. 339, 343, 404 P.2d 692, 694-95 (1965). The Commission has no authority or jurisdiction to control the internal affairs of a corporation. *Arizona Corp. Comm'n v. Consolidated Stage Co.,* 63 Ariz. 257, 263, 161 P.2d 110,

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112 (1945). Courts will not infer a grant of authority to interfere with utilities management decisions beyond a clear intent of the statute. *See Phelps Dodge Corp. v. Arizona Elec. Power Co-op, Inc.*, 207 Ariz. 95, 113, ¶ 59, 83 P.3d 573, 591 (App. 2004).

Here, Staff's authority over the financing request is limited to analyzing the factors under A.R.S. § 40-301(C). Staff does not dispute that CWCGV has met all of the requirements in that statute. The Company can afford the Storage Tank, has the authority to finance it and is seeking it for lawful purposes. CWCGV has shown how it will improve service under both normal operation conditions, and under emergency circumstances, while also maintaining service when other components of CWCGV's system are down for maintenance or repairs. The Company has justified the increase in storage capacity from 1.0-million to 2.0-million gallons. Having the Storage Tank is in the public interest by CWCGV providing superior service to a customer base that wants and needs that service. In short, CWCGV's request meets the requirements in the statute.

Instead, Staff states that its recommendation to have CWCGV "investigate the possibility of upgrading one of its two on-site generators" is reasonable. That is not the applicable standard, and cannot be the basis to deny the Company's request. Further, the Company has provided numerous concerns with backup on-site generation, and why the Storage Tank is a better solution.

The fact remains that CWCGV's volunteer board of directors (consisting of highly-educated and highly-capable individuals with successful and accomplished careers – and who are also customers) together with its experienced management have decided that the Storage Tank is the best option to maintain and improve adequate, safe and reliable service to its member-customers. The Company has *always* had accomplished and qualified leadership on the board teamed with experienced management when its system was designed and implemented – as shown in Exhibit 1 to this filing. The Company has the financial and technical capability to pursue this option. A.R.S. § 40-301(C) does not specifically authorize Staff to substitute its judgment for that of CWCGV if the Company has met the requirements. If the legislature intended to authorize the Commission to orchestrate how the Company should ensure safe and reliable service when reviewing a financing request, for example, it would have stated that in the statute. *See Phelps*

Dodge, 207 Ariz. at 95, ¶ 60, 83 P.3d at 591 (holding that the Commission lacked the authority to promulgate rules forcing Affected Utilities to establish administrators to oversee fair access to transmission). The legislature did not. Thus, Staff's reasons behind denying the Company's financing request for the Storage Tank – when that request meets the statutory standard – impermissibly interferes with CWCGV and its management.

B. Response to Staff's answers to Administrative Law Judge questions in July 11, 2014 Procedural Order.

1. Staff's position as to whether the Existing Storage Tank should be replaced by a comparable sized 1,000,000 gallon storage tank. If Staff believes that the Existing Storage Tank does not need to be replaced, provide an engineering analysis to explain why not.

Staff's engineering analysis appears primarily based on the minimum storage requirements contained in Arizona Department of Environmental Quality ("ADEQ") regulations at A.A.C. R18-5-503. But Staff's engineering analysis ignores CWCGV's system design that has been in place for over 37 years, as well as the customer profile of CWCGV. Staff also does not dispute that the Storage Tank will meet the 48-hour standard recommended by both the U.S. Environmental Protection Agency ("EPA") and American Water Works Association ("AWWA") when an emergency situation arises. Staff did not dispute that standard as unreasonable or inappropriate. It is perplexing, however, why the Company would be denied the opportunity to maintain and improve its system (such as exceeding minimum ADEQ requirements) when it can afford to do so.

Further, Staff ignores how the Storage Tank maintains and improves reliability when part of CWCGV's system is down for maintenance or repairs and provides additional benefits under normal operating circumstances. Staff does not question the Company's detailed analysis of the different categories of storage and how that factored into its determination that 2.0-million gallons of storage is appropriate to provide 48 hours of service in an emergency (based on average use per day throughout 2013). Staff does not dispute the Storage Tank will provide 48 hours of available water (without reliance on additional pumping) in an emergency. Merely replacing the existing

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Reservoir #2 with a 1.0-million gallon storage facility will not provide for this level of security. CWCGV believes the additional $200,000 is worth spending to achieve the 48-hour standard.

Staff's latest engineering report also misstates why the Company believes the Storage Tank is necessary. The Company indicated that the Storage Tank is needed to address a major event *such as* a power failure that impacts its entire system. *See* Company Response to Staff DR 5.4 (part of Exhibit 1 to the Company's July 2, 2014 filing). But the Company never stated that a power failure is a "top reason"; and CWCGV is not requesting financing for the Storage Tank to deal only with a power failure event. The Company is planning years ahead to ensure it can reliability deliver safe water to its member-customers under a wide variety of circumstances (including protecting the system against most potential events and addressing significant water quality issues in its area.) The fact remains that having water *already available in storage* to deal with those circumstances is a superior option than having to rely on emergency generators to pump water that could be adversely impacted by a major event. Further, a backup generator at a well site would be useless if that site or the related transmission mains are also adversely impacted.

Moreover, Staff's recommendation to "investigate the possibility of upgrading one of its two on-site generators" ignores the analysis the Company performed and provided to Staff. The problems of additional on-site generation were summarized in the Company's July 2, 2014 Response. The Company vetted the generator alternative and chose the Storage Tank as a better solution. Staff received the CWCGV's analysis and reasoning why in discovery.

Nonetheless, CWCGV engaged a professional engineer to conduct further analysis. Attached as Exhibit 2 to this filing is a registered professional engineering report from CPE Consultants, L.L.C. (and Raul Pina, P.E.). This report evaluates the potential options to replacing the existing Reservoir #2. The findings and conclusions of that analysis indicate upgrading the existing generators is not going to be as inexpensive as compared to the Storage Tank. Further, adding standby generation does not mean a better option at a lower price. Generators will also need maintenance to keep them ready, while not giving CWCGV the full control over contingencies that the Storage Tank would provide. In addition, standby generation will not

provide the same level of reliability, and will not provide CWCGV the same assurances that it can meet the 48-hour standard in an emergency situation. Also, the Storage Tank provides the extra benefit of realizing a pumping cost savings at the Well #10 booster site while also realizing operational improvements. This is because it eliminates the water transportation friction losses. Finally, this report confirms that simply removing Reservoir #2 is not an effective solution, since that would barely meet minimum ADEQ requirements.

2. **Staff's explanation of its position of each of the claimed CWCGV benefits: (1) reducing pumping costs at Well No. 10; (2) providing 48 hours of emergency water supply; (3) eliminating the need for a pressure pump at the Reservoir No. 2 site; (4) eliminating the maintenance costs associated with repairing the Existing Storage Tank; and (5) providing better protection from contamination and vandalism. Whether and to what extent Staff considered these benefits when reaching its recommendations.**

Obviously, maintenance costs are reduced, for example, if the existing Reservoir #2 is closed without replacement. What Staff's latest engineering report ignores (when responding to these questions) is the corresponding benefit to having the Storage Tank versus having no replacement. For instance, the Storage Tank eliminates the need for the pressure pump *and* provides additional storage in an emergency to provide 48 hours of average daily use in a peak month for its customers. Staff fails to address how simply removing Reservoir #2 meets this standard put forth by both EPA and AWWA. It eliminates contamination and vandalism problems while providing these and other benefits. The Company's position is buttressed by a professional engineering opinion provided in discovery – as amended in the Company's July 9, 2014 supplemental filing.

The Company has provided undisputed justification for how replacing Reservoir #2 with the Storage Tank best benefits it and its system under different operating situations through data responses. While the Company cannot exactly quantify how much pumping costs will be reduced, reduced pumping cost is an undisputed assessment from a professional engineer that lends further support for the Storage Tank. Further, if CWCGV were to put in additional generation at one of the

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well sites, the costs of doing so (which includes addressing environmental concerns and permitting) will significantly reduce any savings Staff's engineer asserts will occur.

3. Explaining why adjustments were made to the categories labeled, "Attorney Fees," "Overhead (5%)," and "Contingency.

Staff's response in the latest engineering report has several flaws. First, Staff is basing its "not reasonable" conclusion on costs for a 1.0-million gallon storage tank. The Company is requesting a 2.0-million gallon storage tank. The total bid for the Storage Tank is $875,660, with "other costs" equaling $324,340 (approximately 27%) of the total $1.2-million in financing requested. "Other costs" are not as high of a percentage as Staff's engineer implies for the Storage Tank.

Second, Staff's engineer does not take issue with many of those so-called "other costs." These include taxes at a 6.1% rate ($53,415), controls reconfiguration ($15,000), flowmeters ($15,500), and fencing ($33,434). Those costs are reasonable components to installing and operating the Storage Tank.

Third, the Company proposed a contingency that is approximately 11% of total. The Company may not need that total ultimately, but should not be foreclosed from obtaining that amount if it becomes needed. An 11% contingency is less than the 18% contingency included in the 2009 Arizona American Water Company request for financing the Tubac division arsenic removal project. *See* Decision No. 71168 (June 16, 2009). And even factoring in taxes, CWCGV's contingency line-item would appear to account for no more than 12.2% of the total.

Finally, CWCGV explained and clarified that the attorney fees and overhead are going to be incurred regardless of whether the Company simply refinances its existing debt, or includes the financing for the Storage Tank. Even Staff admits that $20,000 in attorney's fees is not excessive (costs have already exceeded $20,000 because of this proceeding) for the entire $3.4-million financing requested. This is also why the Company is seeking approval up to $2.2 million for the refinancing.

4. Provide a detailed financial analysis of the Company to reflect the issuance of a $3.4-million, 20-year amortizing loan, at both the taxable swap rate of 5.80% per annum and the tax exempt swap rate of 3.97% per annum.

The Company concurs with Staff's financial analysis that shows Debt Service Coverage ("DSC") ratios of 4.30 (reflecting a 5.80% per annum taxable swap rate) and 5.02 (reflecting a 3.97% per annum taxable swap rate). The Company also notes Times Interest Earned Ratios ("TIER") of 1.86 and 2.73 respectively. This shows the ample ability sufficient cash flow from CWCGV operations to cover debt service for the entire $3.4-million request. Clearly, the Company has the capability to finance the Storage Tank along with the refinancing of existing debt.

5. Other issues raised by Staff.

Staff does not appear to raise any additional issues. The bottom line is that the Storage Tank will ensure CWCGV has 48-hours of an available water supply already within its system to withstand a major event; that the Storage Tank will maintain and improve CWCGV's system integrity; that it will provide benefits under normal operating circumstances, as well as under a wide variety of circumstances (including when other portions of its system are down for repairs or maintenance). The Company's request meets the requirements of A.R.S. § 40-301(C); Staff cannot substitute its judgment for that of the Company when the statutory requirements are met. *See Southern Pacific,* 98 Ariz. at 343, 404 P.2d at 694 (stating that "plainly it is not the purpose of regulatory bodies to manage the affairs of a corporation.") Staff's justifies its denial recommendation based on its apparent belief that the on-site generator alternative is "reasonable." This effectively substitutes its judgment for the Company. That is inappropriate and interferes with CWCGV's management prerogative. As a result, Staff's recommendation to deny financing for the Storage Tank should be rejected and the Company's full financing request should be approved.

The Company therefore maintains its request as set forth in its February 12, 2014 Application and its July 2, 2014 Response.

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RESPECTFULLY SUBMITTED this 14th day of August, 2014.

COMMUNITY WATER COMPANY OF GREEN VALLEY

By _____

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Original and thirteen copies of the foregoing filed this 14th day of August, 2014, with:

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Exhibit-1

Community Water Company of Green Valley
Our Leadership 1975 to Present

Chair of the Board of Directors

1977-1981	Charles F Bonnet, PE	Metallurgical Engineering Graduate of the Colorado School of Mines Graduate of the Harvard Business School, Retired from American Cyanamid Company as Assistant General Manager
1982-1986	John S Haynes, PE	Retired Engineering Director – Monsanto Company
1987-1995	James F Thomson	Retired Chief, Environmental Health, A.I.D., U.S. Department of State
1996-1997	John W Frame	Retired Manager of Product Research – Bethlehem Steel Corporation
1998-2003	Raymond L Smith, PhD	Retired President, Michigan Technological University BS University of Alaska, MS University of Pennsylvania. PhD University of Pennsylvania, four honorary PhDs from other Universities.
2004-2005	John R McCandless	Lieutenant Colonel, UMSC – Retired
2006-2010	Kenneth M Taylor	Brigadier General, USAF – Retired, Pilot, staff officer, commander. Past commander, Alaska Air National Guard.
2011-Present	Virgil W Davis, PE	Retired Director, University Research Foundation, Inc. Retired Director University Research Foundation of multi-company advanced aircraft avionics programs. Chief Operating Officer of an east coast electronics firm. Director at several commercial and military firms. Master's degree in engineering from Case Western Reserve University, Cleveland, Ohio and both mechanical and electrical engineering degrees from the University of Michigan, Dearborn Campus.

President/General Managers

1977-1995	James R Livingston	Past President of Arizona Water Company
1996-1999	Alan D Forrest. PE	Past Tucson Water Chief Planning Engineer, MBA, past Director of Oro Valley Water, past Vice President & Area Manager – CH2 and present Director of Tucson Water
2000-2002	Michael D Weber, PE	Glendale's Deputy Director of Water Resources, President/General Manager, Vice President, and Operations Manager for various water and sewer utility companies in Arizona, Texas, Missouri, and Illinois. Peoria Deputy Public Works-Utilities Director, has a BS in Civil Engineering, an MBA, and a CPM, and grade 4 operator in all categories. MBA, CPM
2003-Present	Arturo R Gabaldón	Current President of Community Water Company of Green Valley, MBA, CPA

Name	Final Role	Background	Dates of Service
Virgil W. Davis	Chairman	Retired Director, Electronic Programs University Research Foundation, Inc.	2003-Current
Tom J. Six	Treasurer	Retired Chief Financial Officer Ameritech Information Systems	2006-Current
Sandra L. Stone	Board	Retired Secondary School Educator Texas and Syracuse, NY	2006-Current
Donna Severidt	Board	Retired Computer Consultant & Manager Chicago, IL	2008-Current
Thomas E. Cooke	Board	Retired Trial Attorney Cooke, Lamanna, Smith & Cogswell	2010-Current
Clarence M. Ebert	Board	Retired Contactor	2010-Current
Donald Weaver	Board	Retired Executive Data	2012-Current
Paul D. Williamsen	Board	Retired Scheduling Supervisor Chemical Systems Division - UTC	2010-Current
Arturo Gabaldón	President	Community Water Company	1990-Current
Richard W. Cox	Consultant	Retired Insurance Agent	2013-Current
Edith J. Webber	Consultant	Retired Educator and Public Representative	2013-Current

Past Board Members and Board Consultants

B. George Balwin	Board	Retired Regional General Manger The Canadian Imperial Bank of Commerce	1975-1976
Burn Bannister	Secretary	Retired Lawyer	1975-1983
Fred H. Dettmar	Board	Dayton Power and Light	1975-1979
Victor C. Folsom	Board	Retired International Lawye	1975-1980
Fred C. Humphreys	Board	Retired Vice President Engineering Consulting Company	1975-1978
Dorothy Mignault	Board	Retired	1975-1978
William M. Snyder	Board	Retired Bank Officer	1975-1980
Nathaniel R. Winslow	Board	Retired Pfister Chemical Inc.	1975-1979
George S. Unwin	Treasurer	Retired Banker	1976-1978
Richard R. Scholz	Board	Retired	1976-1977
George E. Olmsted	Vice President	Retired Consumers Power Company	1977-1980
Hubert W. Stone	Board	Retired Connecticut Publishing Expenditure Council	1977-1980
Leonard T. Nelson	Board	Retired Secretary-Treasurer Central Corporation	1977-1987
Louis Bertrand	Board	Retired Chemical Engineer E.I. dePont de Nemours & Company	1978-1994

Name	Final Role	Background	Dates of Service
Richard R. Scholz	Treasurer	Retired Accountant	1979-1984
Robert K. Zimmerman	Board	Retired Chairman of the Board Kansas City Power & Light Company	1979-1994
Perc H. Williams	Board	Retired Division Superintendent AT&T Company	1980-1984
Frederick A. Fielder	Board	Retired Chief Executive Officer CF&I Steel Corporation	1985-1992
Robert L. Elston	Secretary	Retired Vice-President Atlantic Richfield Company	1985-1994
Donald Garlock	Treasurer	Retired Certified Public Accountant-Partner Clifton, Gunderson & Co.	1986-1993
David A. Rainey	Board	Retired Assistant Vice-President Colorado & Southern & FW&D Railways	1987-2002
Robert W. Liddell	Secretary	Retired R&D Manager Calgon Division, Merck & Company, Inc.	1987-2006
Alan J. Young	Consultant	Retired Manpower Planning Consultant Westinghouse Electric Corporation	1990-1994
Alan W. Fraser	Vice Chairman	Retired Mining/Construction Engineer Consultant	1991-1998
James A. Albertson	Secretary	Retired Regional Manager Consumers Power Company	1992-1997
George H. Fielder	Board	Retired Vice-President Otis Elevator Company	1994-2002
Roy H. Erichsen	Vice Chairman	Retired CEO and President H.G.E. Inc. Engineer/Planners	1995-2009
Lewis E. Denny	Treasurer	Retired Vice-President First Interstate Bank of Arizona, Inc.	1996-2001
Roger L. Rogge	Board	Retired Manager of Operations Ford Forestry Center, Michigan Tech Univ.	1998-2013
Grant E. McMartin	Board	Retired Partner White, McMartin & Anderson, Attorneys	1999-2006
Karen Spada	Consultant	Family Nurse Practitioner, RN, MPH, MSN	2000-2001
Cynthia Castro-Minnehan	Consultant	Instructor Internet Tech & Data Base Systems	2003-2003
Warren H. Engelland	Board	Retired, Vice President Cargill, Inc.	2004-2010
Robert A. Lembcke	Board	Retired Director and VP of Mfg. Peck, Inc.	2004-2011
Don E. Singleton	Board	Retired Staff Engineer IBM Development Laboratory	2005-2008
William J. McNarie	Consultant	Retired School Administrator Sahuarita Unified School District	2005-2005
Roger Westrate	Consultant	Retired Civil Engineer City of Wyoming, Michigan	2005-2009
Roberta Konen	Board	Retired Office Manager and Theatrical Producer	2006-2005
Jerry Belenker	Board	Retired Attorney USPS Consumer Protection Service	2007-2013
Charles George	Board	Retired - Public Works Cody, WY	2008-2010

Name	Final Role	Background	Dates of Service
Marianne Collins	Board	Retired - Reading Teacher Specialist	2009-2014
Richard Duchaine	Board	Retired - Appleton Papers, Inc Appleton, WI	2009-2013
Albert D. Le Page	Consultant	Retired Supervisor Norwich Dept., of Public Works	2010-2011
J. Frank McCormick	Consultant	Retired Senior Ecologist U.S. Dept. of the Interior	2010-2011
Donald J. Kamin	Consultant	Retired Accountant	2012-2014
Haynes H. Charles	Consultant	Retired Print Sales Manager	2013-2014

Exhibit-2

ENGINEER'S RESERVOIR SELECTION REPORT

Prepared for:

Community Water Company of Green Valley
1501 S. La Canada Drive
Green Valley, AZ 85622

Prepared by:

CPE Consultants, LLC

3895 N. Business Center Drive
Suite 115
Tucson, AZ 85705

August 13, 2014

1. INTRODUCTION

Community Water Company of Green Valley (CWC) is a municipal water provider in southern Arizona. It primarily serves the communities of Green Valley and the Town of Sahuarita; both communities are in southeastern Pima County, Arizona (see Figure 1, Location Map). According to official records on file in the Arizona Corporation Commission (ACC), its service area is about 9.44 square miles or 6,000 acres, and it provides water to nearly 13,000 connections/customers (see Figure 2, Service Area Map). The CWC "Annual Water Withdrawal Report" to ADWR informs that a total of 796.0 million gallons (MG) was pumped from its wells in 2013.

CWC is evaluating alternatives for repairs to one of its water reservoirs, water reservoir #2 (WR#2). In its evaluation CWC will consider the cost benefits and long term effects of each alternative. The alternatives considered include: the rehabilitation of existing WR#2, the construction of a new steel tank reservoir to replace WR#2, or the decommission of WR#2 and acquisition and installation of a standby generator to power CWC's largest water production well and booster site.

2. PURPOSE

The purpose of this report is to evaluate the relative need for WR#2 and its replacement with a new reservoir, and to compare the new reservoir cost with that of acquiring a standby generator, and to compare the cost-effectiveness between the two options considered for implementation by CWC.

3. BACKGROUND

WR#2 was originally constructed in 1975. It is a 1MG hypalon bladder tank, placed within a gunite concrete structure excavated into the surrounding high terrain, at the western end of the CWC service area. The hypalon tank was last replaced in 1999. Together with WR#3 and WR#4, WR#2 provides water to the entire CWC service area. One special feature of WR#2 is that its operating level is 20' below that of the other two reservoirs, which has created the need for a special valve arrangement designed to equalize and coordinate water supplied from the three reservoirs.

CWC has expressed concerns over the current condition of WR#2, because it is representative of an older design technology and its hypalon tank has had several tears that have been repaired; it is exposed to the elements; and it is vulnerable to vandalism and at risk for contamination (see Exhibit 1, CWC Responses to ACC Second Set of Data Requests). For these reasons and because the hypalon tank is near its usable lifetime, it will soon need replacement.

CWC wishes to evaluate its reservoir rehabilitation/replacement options, including the use of a steel tank reservoir instead of a new hypalon tank (see Figure 3, Continental Road Reservoir Improvements). Another consideration for construction of a new reservoir is that a new tank can be placed at an operating level similar to the other two in its pressure zone, thus eliminating the need for the special valve arrangement currently in place at WR#2. Further, CWC would prefer to increase the WR#2 capacity to 2MG of water. This will begin to address capacity issues for storage needs within the CWC service area, in accordance with the provisions of its Certificate of Convenience and Necessity (CC&N).

4. EXISTING CONDITIONS

CWC is classified as a multiple-well community water system by the State of Arizona. Its water system is served by four wells, which together are rated as having a water production capacity of 6,250 gallons per minute (GPM), equipped with electric motor driven pumps (see Tables 1 and 2, below).

Operating Capacity		
Well No.	Discharge Pressure (psi)	Discharge Volume (gpm)
6	104	570
9	96	980
10	5	2,250
11	5	2,450
Totals		6,250

Table 1. Well Water Production Capacity
(from CWC records)

Pumping Station Location		Pump Design Data		Pump Operating Parameters		
Location	Type	ID	Design Discharge (gpm)	Pumps in Operation	Operating Head (ft)	Total Discharge at OpHead (gpm)
Reservoir No. 1, Zone 2 Booster Station	Booster	1	700	1	125	700
Reservoir No. 1, Zone 2 Natural Gas Engine Pump	Booster	1	1,500	1	102	1,500
La Cañada Transfer Station	Transfer	1	350	1	240	350
Well #10, Zone 4 Transfer Station (w/Reservoir No. 3 Control)	Transfer	1	625	1	291	700
		2	625	2	306	1,350
		3	625	3	323	1,800
		4	625	4	346	1,900
		5	625	Standby Pump Unit		
Well #11, Zone 4 Transfer Station	Transfer	1	625	1	398	780
		2	625	2	415	1,500
		3	625	3	443	2,100
		4	625	4	476	2,600
		5	625	Standby Pump Unit		

Table 2. Well Pumping Facilities
(from CWC records)

The wells deliver water to four storage reservoirs and two water tanks, with a combined design storage capacity of 5.6MG and an average operating capacity of 3.8MG (see Table 3, below).

Operating Capacity				
Reservoir No.	Facility Storage Type	High Water Level (ft)	Reservoir Design Capacity (gallons)	Average Reservoir Operating Capacity (gallons)
1	Forebay	2,970.0	1,000,000	793,000
2	High Water	3,161.0	1,000,000	659,000
3	High Water	3,181.0	1,000,000	792,000
4	High Water	3,181.0	2,000,000	1,333,000
W#10 Tank	Forebay	2,875.0	300,000	143,750
W#11 Tank	Forebay	2,791.2	300,000	121,875
Totals			5,600,000	3,842,625

Table 3. CWC Water Storage Facilities
(from CWC records)

All of the active wells are equipped with Arsenic treatment plants, which independently treat water extracted from their corresponding well, prior to delivering it to their reservoir or tank (see Table 4, below).

Treatment Facility Location	# of Treatment Vessels	Operating Pressure (psi)	Vessel Treatment Capacity (gpm)	Total Treatment Capacity (gpm)
Well #6	8	92	150	1,200
Well #9	8	114	150	1,200
Well #10	6	5	417	2,500
Well #11	6	5	417	2,500
Total Treatment Capacity (gpm)				7,400

Table 4. Arsenic Treatment Facilities
(from CWC records)

In its Administrative Code, the State of Arizona defines the minimum storage capacity required of a community water system (see Exhibit 2, 18 AAC R18-5-503.Storage Requirements). This is further qualified to include fire flow demand, in AHD Bulletin 10, Design of Water Systems. Pursuant to section R18-5-503, the minimum storage capacity CWC is required to maintain is

$D_{storage}$ = Demand in Average Day of Peak Month + 4-hr Fire Flow (= 2,000 GPM*4 hrs*60 min)

= 2.56 MG + 0.48 MG = 3.04 MG.

CWC elects to abide by the more prudent recommendation from multiple sources such as, AWWA, FEMA, and HDR Engineering's "Handbook of Water Systems", 2nd Edition, which recommend storage of the 48-hour average demand, or

$D_{storage}$ = 2 * Average Daily Demand = 2 * 2.22 MG = 4.44 MG.

CWC has elected to observe this more conservative standard, because its service population is almost entirely retired senior citizens, who are extremely vulnerable to interruptions or disruption of utility service.

The data used for determining average daily demand and average day of peak month demand are based on the latest information on CWC water deliveries to consumers (see Table 5, below, and Exhibit 3, CWC Responses to ACC Fourth Set of Data Requests).

System Requirements
Peak month divided by 30 adjusted for peak day

	Peak Day of Peak Month		Average Day of	Average Day of
Customer Counts	ACC	CWC	**Peak Month**	**Year 2013**
Number of customers at Jan 2013		12,868	12,868	12,868
Number of customers at June 2013	12,902	12,902	12,902	12,902
2013 six month increase		34	34	34
Number of customers at Dec 2013	12,958	12,958	12,958	12,958
Number of customers projected at June 2014		12,992	12,992	12,992
Water Use				
Gallons of water sold June 2013 (ACC basis)	69,556,000			
Gallons of water produced in the year 2013				795,994,000
Gallons of water produced June 2013 (CWC basis)		76,280,000	76,280,000	
Number of customers June 2013	12,902	12,902	12,902	12,902
Average gallons per customer for a month	5,391	5,912	5,912	5,141
Gallons per customer per day (/30)	180	197	197	171
Peak factor (per day x 1.25)	225	246	-	-
Number of customers at Dec 2013	12,958	-	-	-
Number of customers projected to June 2014	-	12,992	12,992	12,992
Avg day of 2013 (based on produced CWC)				**2,226,518**
Avg day of peak month (based on prod CWC)			**2,560,403**	
Peak day of peak month (based on prod CWC)		3,200,504		
Peak day of peak month (based on sold ACC)	2,910,746			
Hourly projected water requirement (gallons)	121,281	133,354	106,683	92,772
48-Hours supply	5,821,492	6,401,009	5,120,807	4,453,037

Table 5. CWC Average and Peak Daily Water Demand
(from CWC records)

Comparing the most recent water demand and available storage figures, it is evident that CWC requires all of the existing storage facilities it operates, in order to comply with current regulations (see Table 6, below). Further, if WR#2 is brought off-line, the remaining available storage capacity

in the system is 3.18MG, which is slightly above the minimum prescribed requirement of 3.04MG, and significantly below the desired recommended storage of 4.4MG. Therefore, CWC should repair or replace WR#2, or it will need to maintain standby power at its largest well, in order to remain in compliance with State requirements, should contingencies arise that cause it to bring any other reservoir off-line (maintenance or similar situation).

Operating Capacity						
Reservoir No.	**Reservoir Design Capacity (gallons)**	**Average Reservoir Operating Capacity (gallons)**	**Alternative 1 WR#2 Off-Line Capacity (gallons)**	**Alternative 2 WR#2 Off-Line 1,000 kW Gen Capacity (gallons)**	**Alternative 3a New WR#2 1MG Capacity (gallons)**	**Alternative 3b New WR#2 2MG Capacity (gallons)**
1	1,000,000	793,000	793,000	793,000	793,000	793,000
2	1,000,000	659,000	0	0	750,000	1,500,000
3	1,000,000	792,000	792,000	792,000	792,000	792,000
4	2,000,000	1,333,000	1,333,000	1,333,000	1,333,000	1,333,000
W#10 Tank	300,000	143,750	143,750	143,750	143,750	143,750
W#11 Tank	300,000	121,875	121,875	121,875	121,875	121,875
W#11 w/1,000 kW Gen				588,000		
Totals	5,600,000	3,842,625	3,183,625	3,771,625	3,933,625	4,683,625

Table 6. Comparison of CWC Storage Scenarios.

5. DEVELOPMENT OF ALTERNATIVES

Four alternatives have been evaluated in this report, as follows:

1. **Do nothing alternative.** Maintain WR#2 as is, and continue operating the special valve arrangement on site. Accomplish the current repairs identified by CWC operators, wait until major repairs are needed at this reservoir and accomplish repairs under near crisis conditions. Additional water demands on the system at a later time will cause additional, unplanned costs. This is the least favorable alternative, because it creates potential disruption of service and distrust about the utility's stability.

2. **Rehabilitation of WR#2.** This option is similar to option one, except that the replacement of the hypalon tank in WR#2 would be formally scheduled, in order to avoid contingency conditions during its replacement. In all other respects the current WR#2 operating status will be maintained.

3. **Construct new reservoir.** This will allow CWC to resolve its water storage issue with minimum disruption to service, and in full control of contingencies. It will provide hydraulic advantages to the system as described in Exhibit 5. Installing a replacement tank that equalizes the operating high water elevation between WR#2 and the other two reservoirs in its pressure zone, realizes pumping cost savings at the Well #10 booster site, because it eliminates

the water transportation friction losses resulting from water pumping through an extra mile of pipeline, from WR#2 to WR#4. This is the most favorable alternative.

4. **Provide a standby generator.** A routinely implemented alternative to avoid the perceived larger costs of reservoir construction, this alternative considers the purchase and installation of a standby generator, for operation under a potential outage. A contingency generator requires sufficient power to operate the well, boosters and the Arsenic treatment plant. Based on a recent energy demand study (see Exhibit 4, Generator Power Requirement), the generator size must be at least 1,000 kW.

   In addition to the acquisition costs, this alternative requires considerable expense to maintain the generators in a standby ready condition. Other significant concerns include the price of fuel and the safety requirements for storing adequate amounts of fuel near a potable water supply, permitting issues, sound and odor, as well as the generator's estimated useful life of 20 years.

6. COSTS

To obtain current cost information for the alternatives evaluated, CWC secured bids from its providers, to address potential costs of the various alternatives considered (see Exhibit 5, Cost Proposals). Comparing the different costs, the initial finding is that repairs to the existing WR#2 will be $500,000. Cost of new steel tank reservoirs are $1.2M for a 2MG reservoir and $1.0M for a 1MG reservoir.

The cost for a new 1,000 kW generator is $598,000 if diesel fueled, or $1.13M if fueled by natural gas. In addition, site improvements will be required, to accommodate the new generator and its base pad (see Figure 4, Modified Well Layout).

Comparison of Costs					
Cost Criteria	**Alternative 2 Repair & Keep WR#2 (Hypalon Tank)**	**Alternative 4a WR#2 Off-Line 1,000 kW Diesel Generator**	**Alternative 4b WR#2 Off-Line 1,000 kW Natural Gas Generator**	**Alternative 3a New WR#2 (1MG Steel) Reservoir**	**Alternative 3b New WR#2 (2MG Steel) Reservoir**
Acquisition and Installation Cost	500,000	467,000	1,135,000	1,000,000	1,200,000
Cost of Additional Improvements	0	50,000	50,000	0	0
Annual Maintenance Cost	12,500	4,400	4,400	800	1,000
Totals (20-yr)	750,000	605,000	1,273,000	1,032,000	1,236,000
Totals (40-yr)	2,000,000	926,500	1,928,500	1,248,000	1,456,000

Notes and Assumptions:

Hypalon Tank Annual Maintenance Cost (250 mhrs, @ $50/hr) =	$ 12,500
Site improvements for new generator (concrete pad, site reconfiguration, permits, etc.) =	$ 50,000
Standby Power Generator Annual Maintenance Cost =	$ 4,400
Steel Tank 10-yr Periodic Minor Interior Coat Maintenance Cost =	$ 8,000
Steel Tank 20-yr Major Interior Maintenance Repairs Cost =	$100,000

Table 7. Comparison of Alternative Costs.

7. SUMMARY AND CONCLUSIONS

A comparison between alternatives reveals that repairing or replacing the hypalon tank in WR#2 is the most expensive alternative, even though it requires the smaller initial investment. This is because maintenance of the hypalon tank requires more active inspection and maintenance than the other options. It is also the most vulnerable to inclement weather and vandalism.

Comparison of the steel tank reservoir and generator alternatives indicates that the cost for a standby generator will approach the cost of a steel tank, which will not require the additional standby ready costs. This is especially true of a natural gas generator. Further, the cost difference between the 1MG and 2MG steel tank is small, when one considers the value of the additional storage capacity obtained for the additional cost.

Finally, the benefits of acquiring a new steel tank reservoir to replace the existing WR#2 are many, among others:

a) full compliance with the more conservative recommended storage capacity, even if any of the other CWC reservoirs are brought off-line for repairs or maintenance;

b) lower maintenance costs and less time of interrupted service for maintenance activities than the other alternatives;

c) lower risk for contingencies and repairs than a generator, since reservoir storage is always at hand and not awaiting activation in case of an emergency;

d) the larger 2MG steel tank reservoir matches the capacity of WR#4, which allows for minimal adverse impact to storage, should the latter reservoir be brought off-line for repairs or maintenance;

e) constructing a new reservoir that equalizes its operating level with that of WR#3 and WR#4 simplifies the interconnectivity of the system and reduces pumping cost for routine filling of reservoirs;

f) having system storage capacity at recommended levels rather than minimum required levels addresses concerns about service to the very vulnerable population in the CWC service area, since they are mostly retired senior citizens;

g) significantly lower vulnerability to vandalism than the other alternatives.

Therefore, our recommendation is the acquisition of a steel tank reservoir. The larger, 2MG reservoir represents greater advantage in terms of storage, when compared to a modest additional cost over the 1MG steel tank reservoir.

8. REFERENCES

1. Arizona Corporation Commission Docket # W-02304A-14-0041, Application for Financing Authorization requested by Community Water Company of Green Valley on February 12, 2014.

2. Arizona Administrative Code Title 18, Section R18-5-503.Storage Requirements.

FIGURES

1. Location Map

2. Service Area Map

3. Continental Road Reservoir Improvements

4. Modified Well Layout - Well No 11 with Standby Generator

EXHIBITS

1. CWC Responses to ACC Second Set of Data Requests dated March 10, 2014.

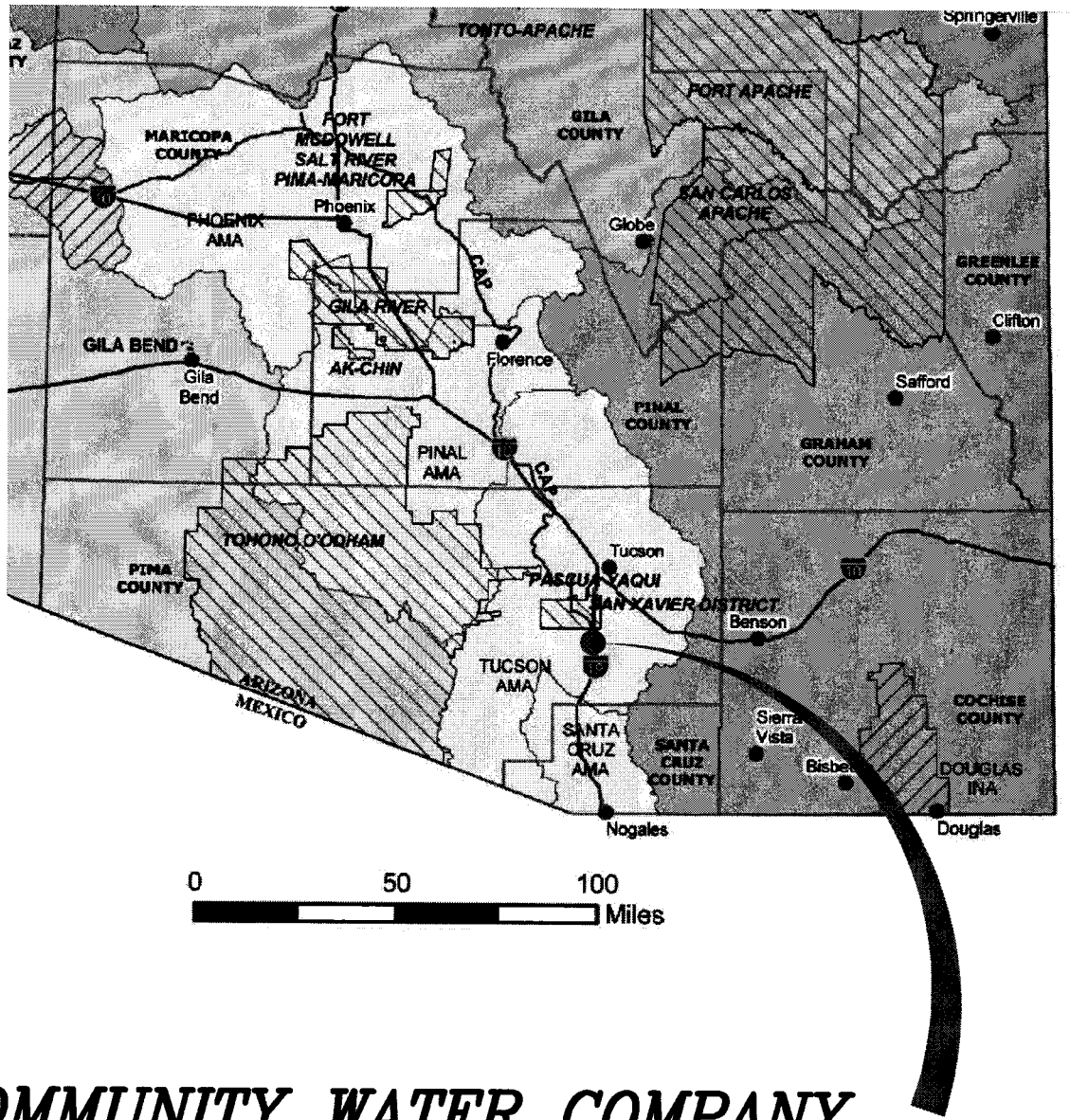
2. 18 AAC, R18-5-503.Storage Requirements.

3. CWC Responses to ACC Fourth Set of Data Requests dated May 2, 2014

4. Generator Power Requirement, August 8, 2014.

5. Cost Proposals

    - CWC Responses to ACC Fifth Set of Data Requests dated May 13, 2014 regarding price difference.
    - CWC Responses to ACC Second Set of Data Requests dated March 10, 2014 regarding cost estimate for new storage tank dated March 17, 2014 and Opinion from Smyth Industries dated July 1, 2014.
    - Smyth Industries Cost Estimate to Raul Piña dated August 8, 2014 for Standby Generator



COMMUNITY WATER COMPANY OF GREEN VALLEY

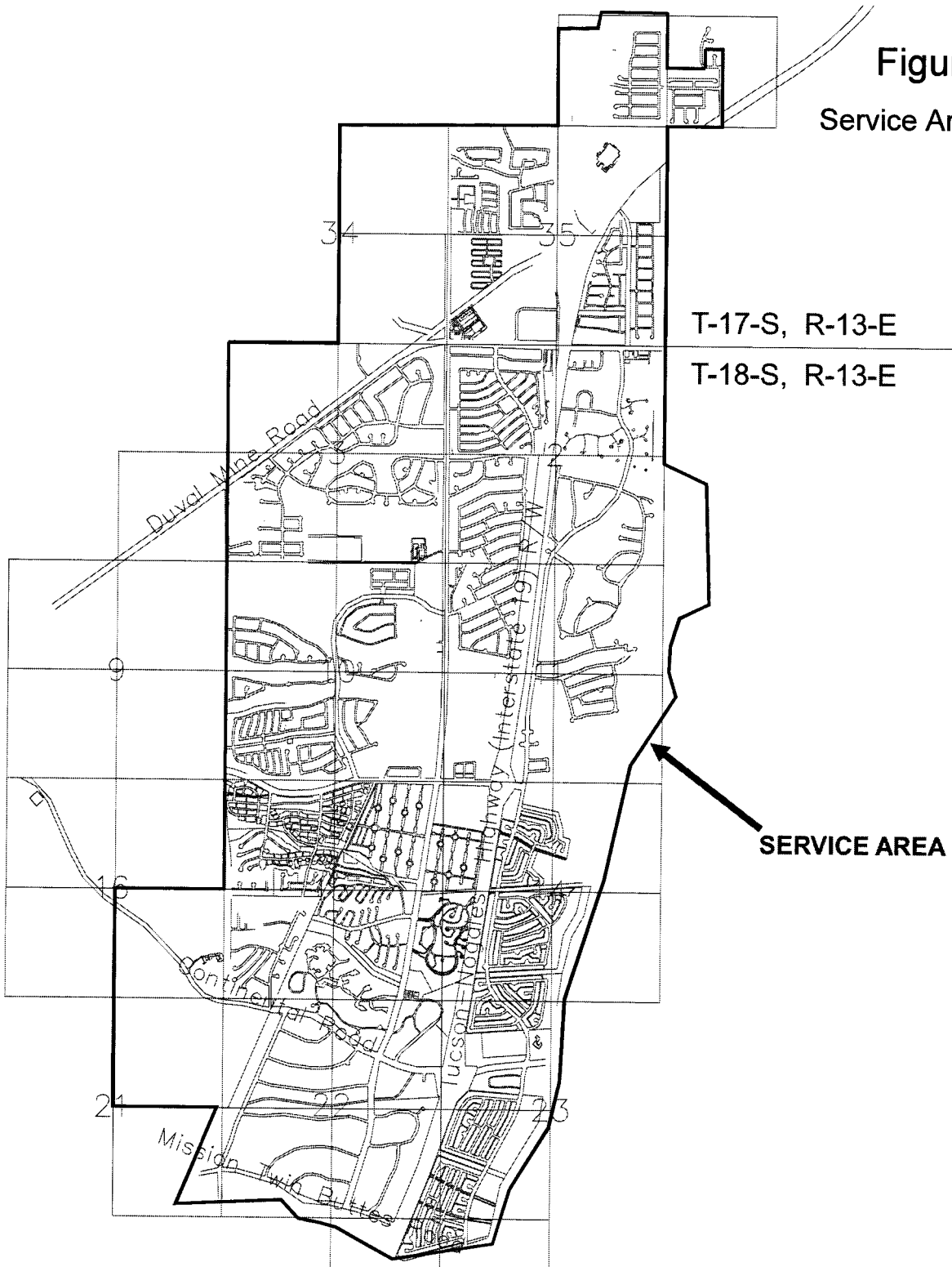
LOCATION MAP

CPE CONSULTANTS
3895 N. Business Center Drive, Suite 115
Tucson, AZ 85705
520•545•7001

FIGURE 1

Figure 2

Service Area Map



Legend:

Community Water Company Service Area Boundary

Stantec

Client / Project

Community Water Company of Green Valley

Water System Improvement Design Plan

Figure No.

1.1

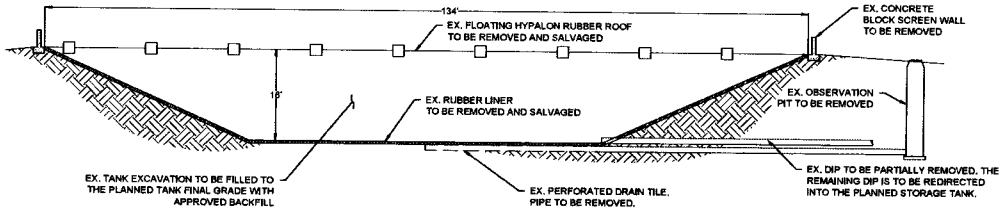
Title

Location Map of Service Area

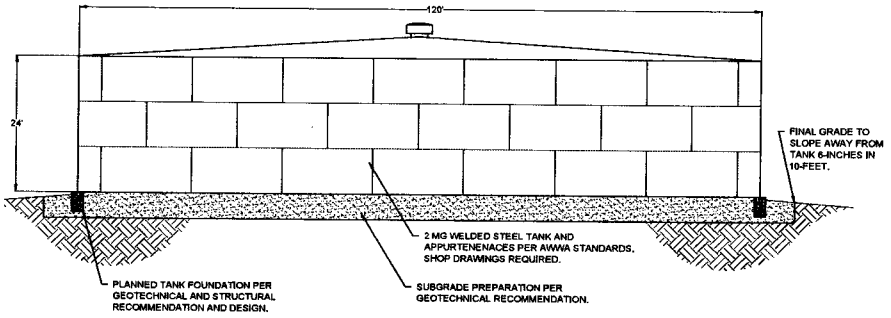
COMMUNITY WATER COMPANY

CONTINENTAL ROAD RESERVOIR IMPROVEMENTS EXHIBIT

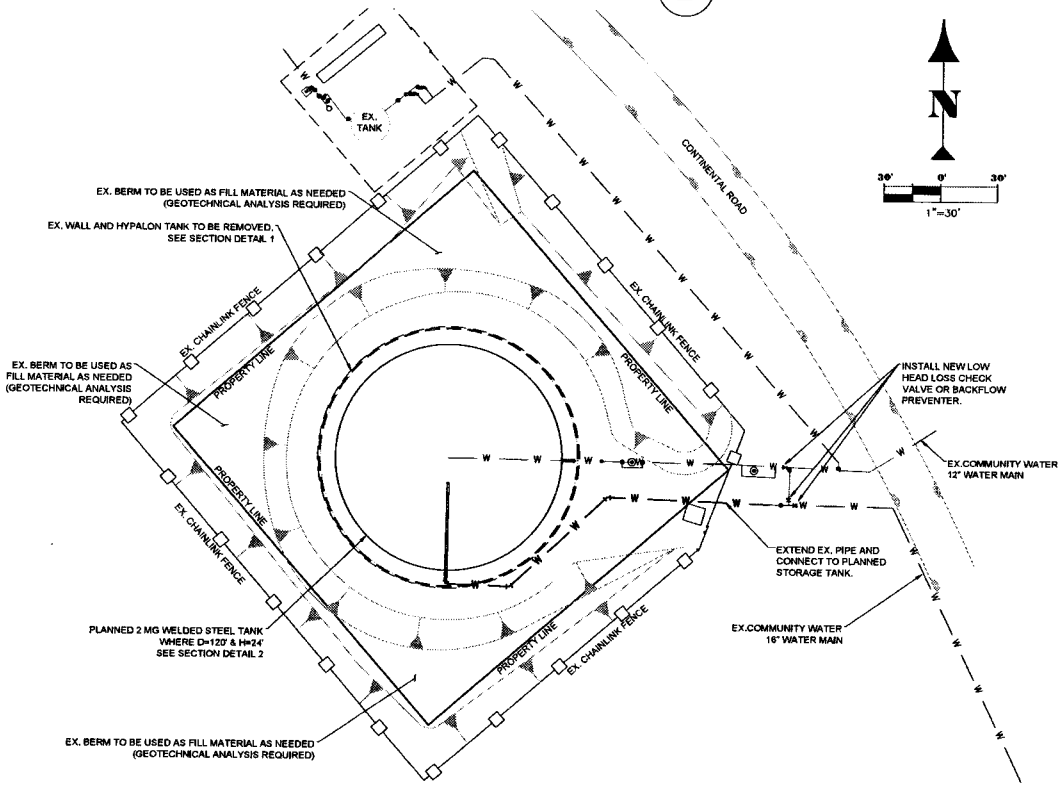
Figure 3



1 EXISTING HYPALON TANK SECTION DETAIL N.T.S.



2 PLANNED 2MG WELDED STEEL TANK SECTION DETAIL N.T.S.



NOTES:
1. THIS PLAN IS CONCEPTUAL ONLY. FINAL TANK DESIGN, PIPE LAYOUT, AND GRADING DESIGN AND RECOMMENDATIONS PER APPROVED PLANS.
2. THE INFORMATION SHOWN ON THIS PLAN IS FOR PLANNING AND SCHEMATIC PURPOSES ONLY.
3. A DETAILED SITE SURVEY WILL BE NECESSARY TO LOCATE AND IDENTIFY ALL PROPERTY LINES, EASEMENTS, AND EXISTING IMPROVEMENTS. tHOSE SHOWN HERE-ON ARE SCHEMATIC ONLY.

PRELIMINARY
NOR FOR
CONSTRUCTION

COMMUNITY WATER COMPANY
1501 S. LA CANADA DR
GREEN VELLEY, AZ 85622
PH: 520-625-8409

SMYTH INDUSTRIES

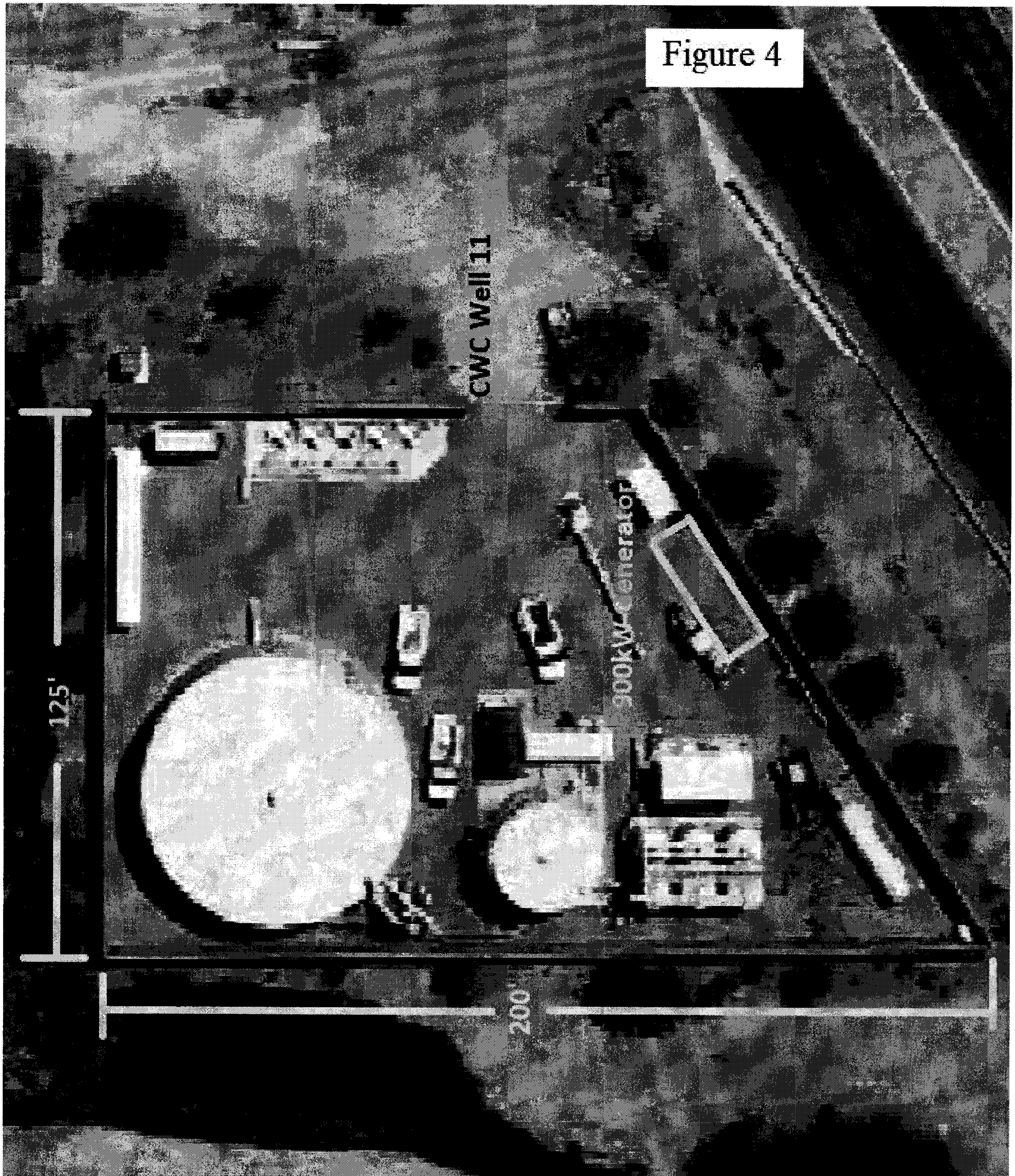


Figure 4

Exhibit 1

COMMUNITY WATER COMPANY OF GREEN VALLEY'S RESPONSES TO STAFF'S SECOND SET OF DATA REQUESTS DOCKET NO. W-02304A-14-0041 Dated March 10, 2014

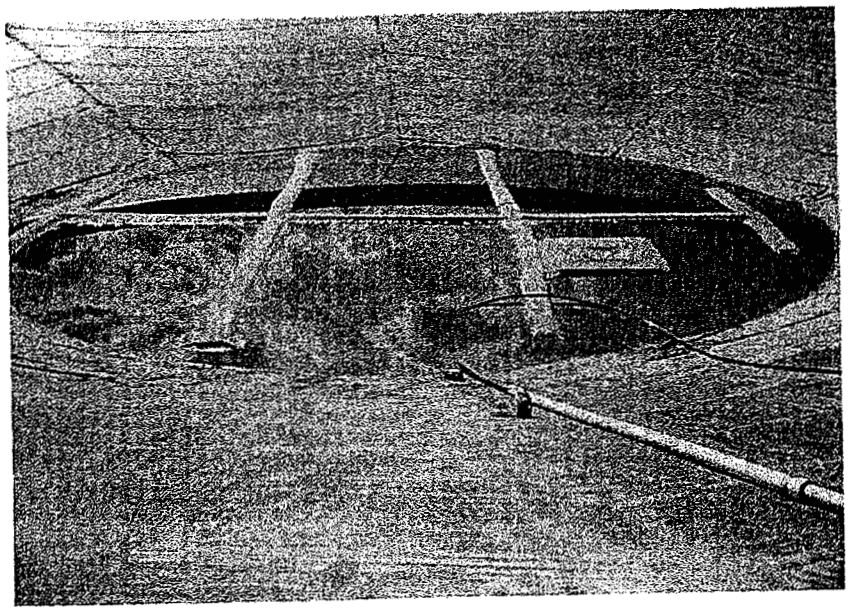
JL 2.2 Risk for Contamination — Please provide all historic information regarding the contamination of the existing Reservoir #2.

RESPONSE: See attached.

Respondent: John Meyer, CWCGV Treatment Supervisor

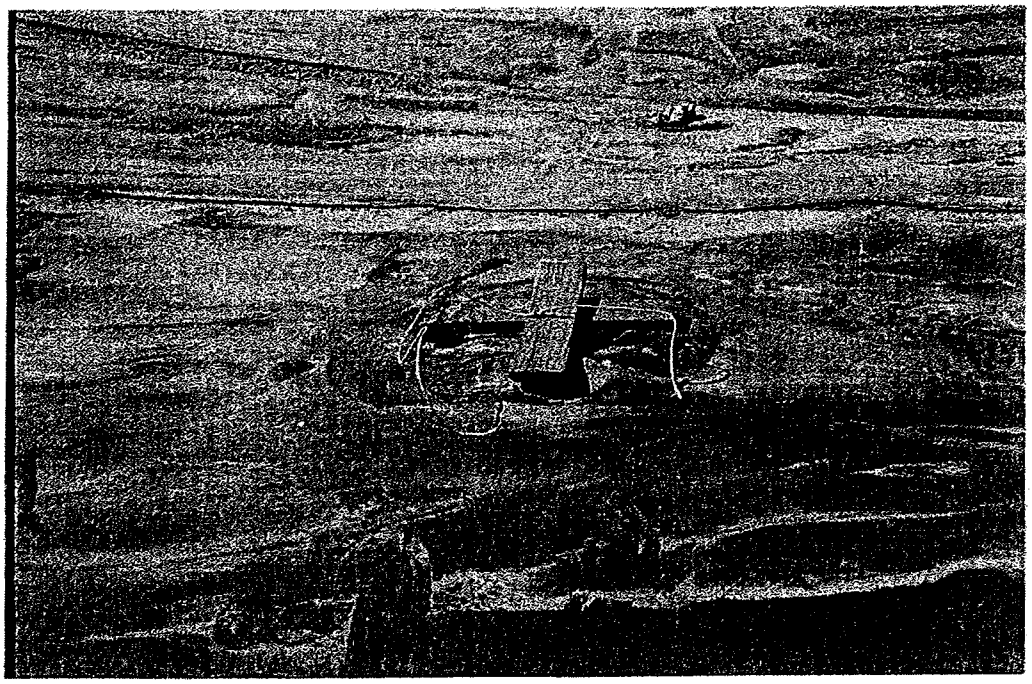
The following pictures represent some of the sources and causes of contamination at CWC Reservoir #2

Res. #2: Large patch failure.

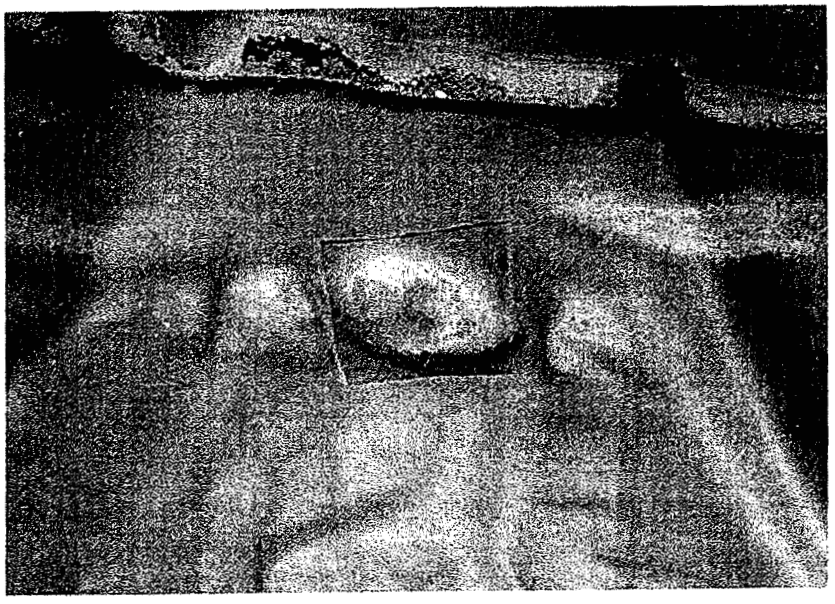


Res. #2: Drained after vandalism.

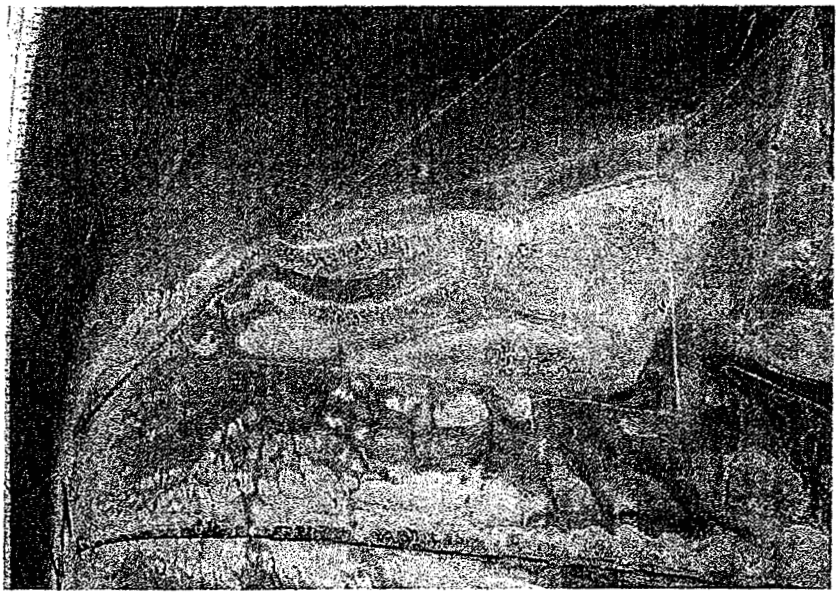
Res. #2: Small patch failure.



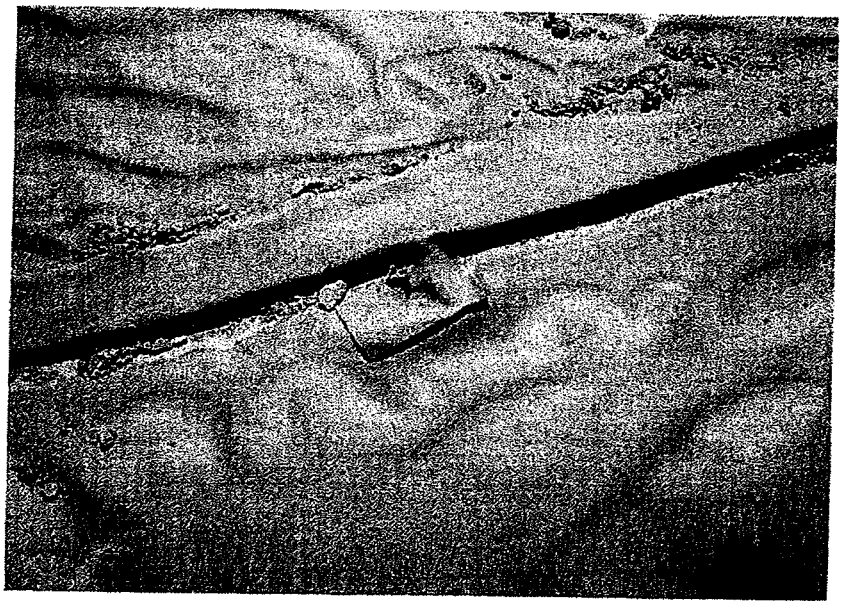
Res. #2: Temporary patch.



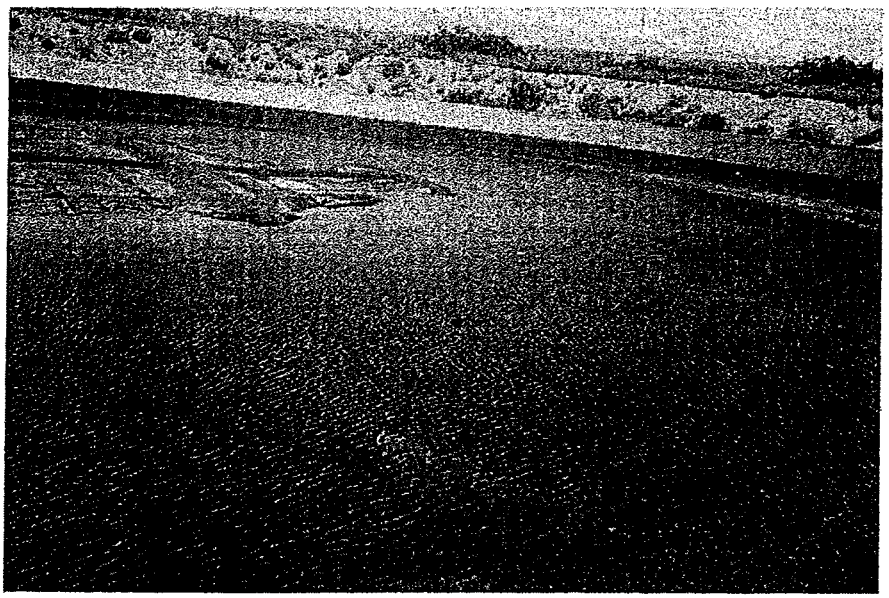
Res. #2: Small patch failure.



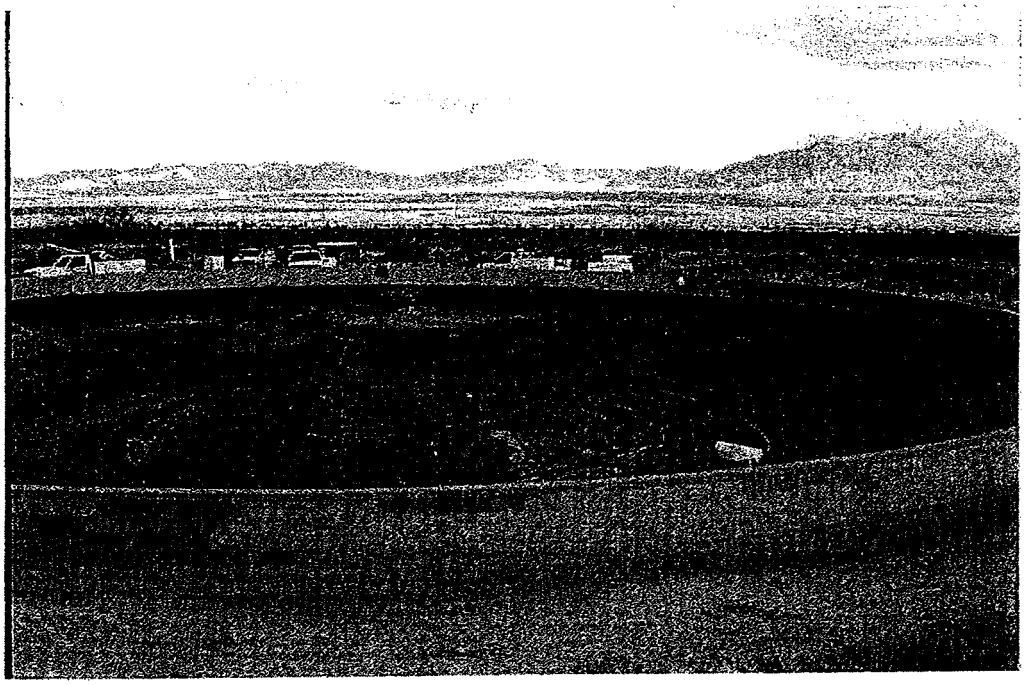
Res. #2: Debris on top of liner.



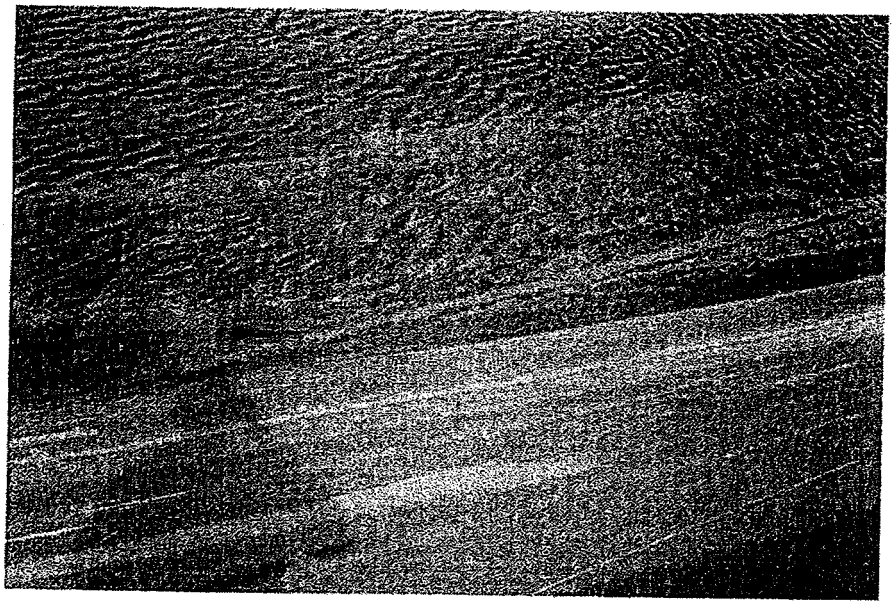
Res. #2: Small patch failure.



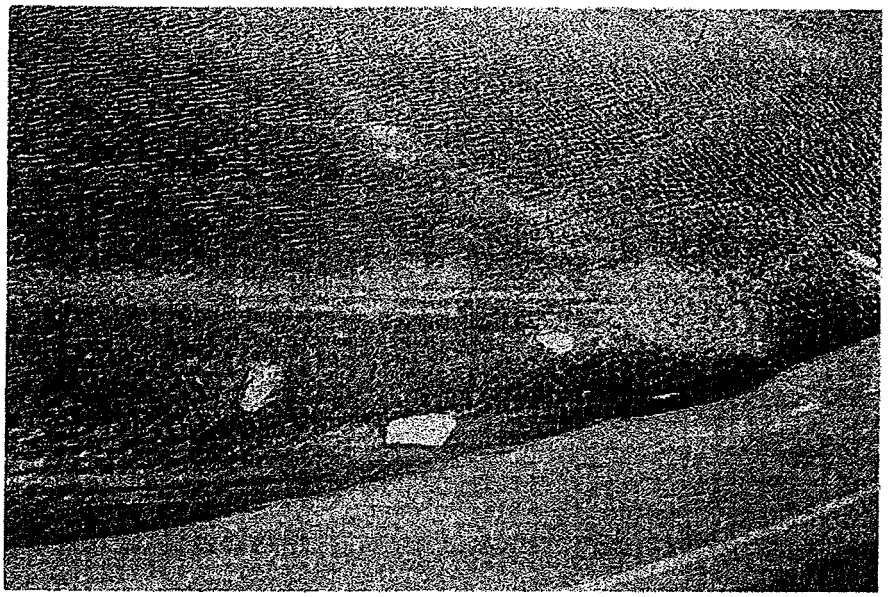
Res. #2: Water on top after vandals sliced liner.



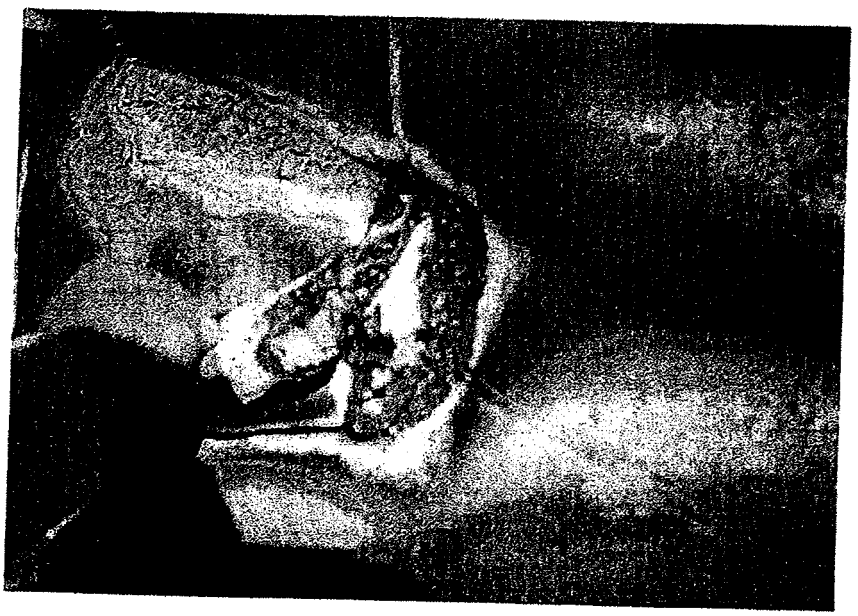
Res. #2: Drained after vandalism.



Res. #2: Aftermath of vandalism.



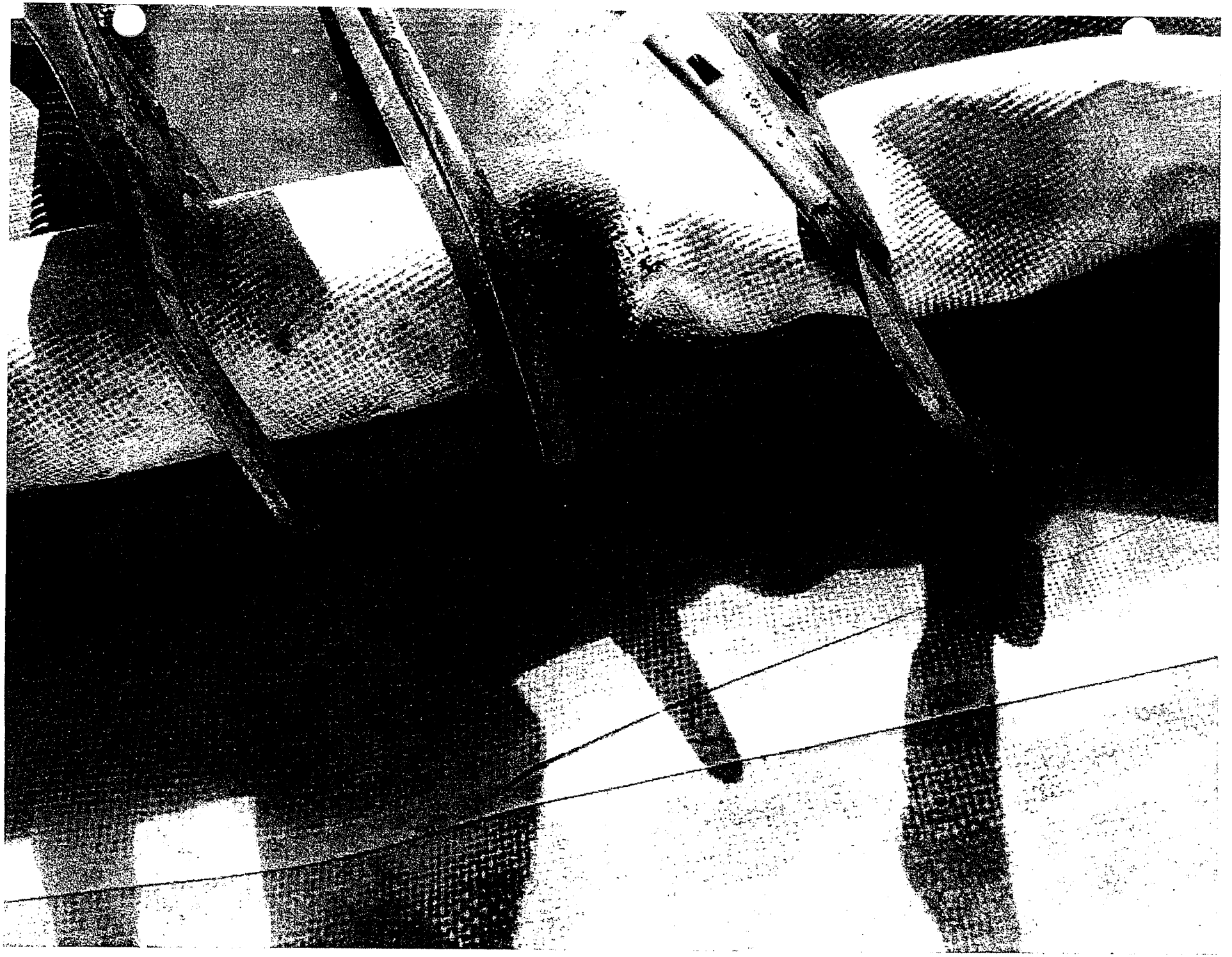
Res. #2: Large rocks and slice in liner by vandals.

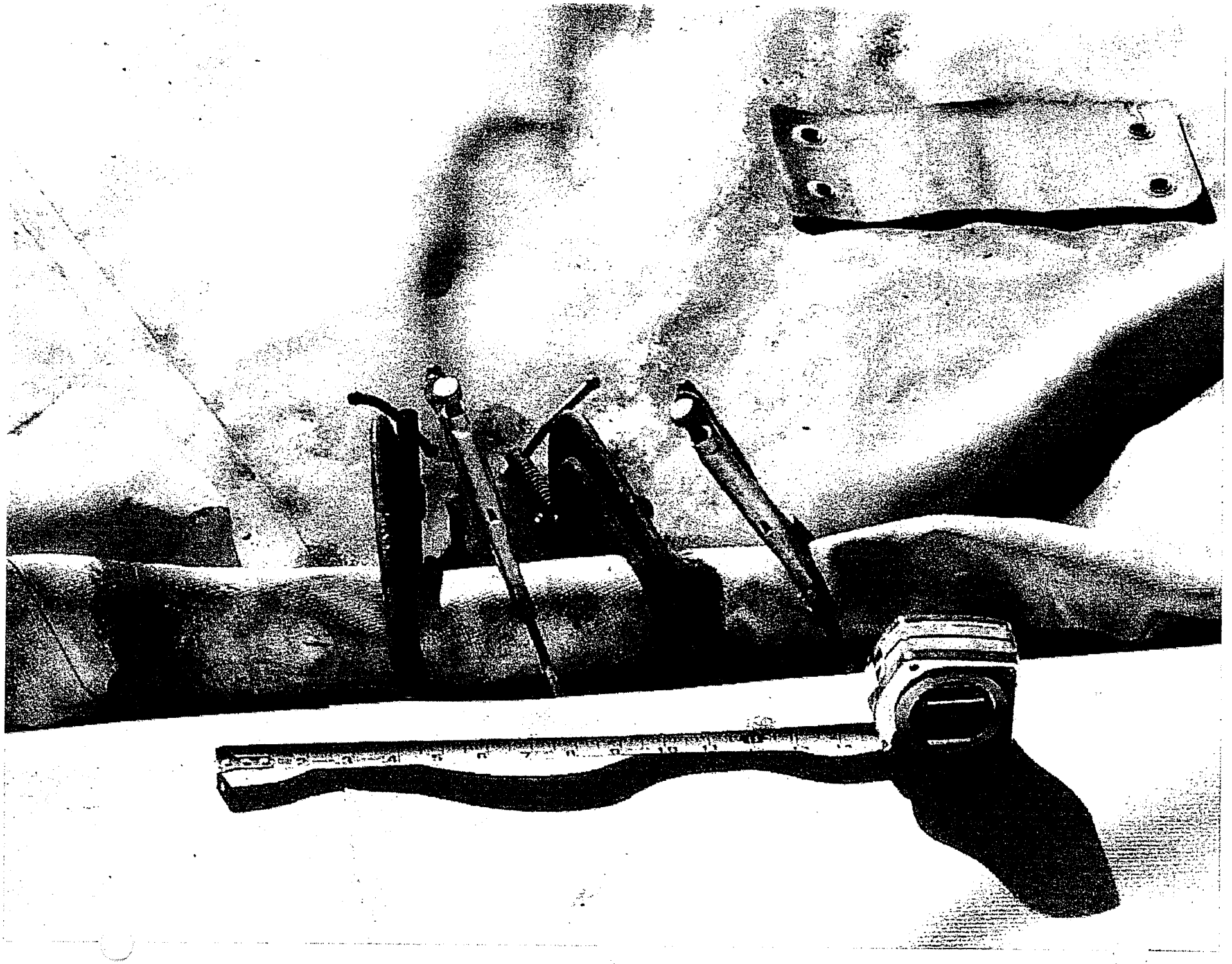


Res. #2: Algae growth under failing patch.

Reservoir #2 safety concerns:

Res. #2: Employee partially submerged on top of liner performing maintenance.





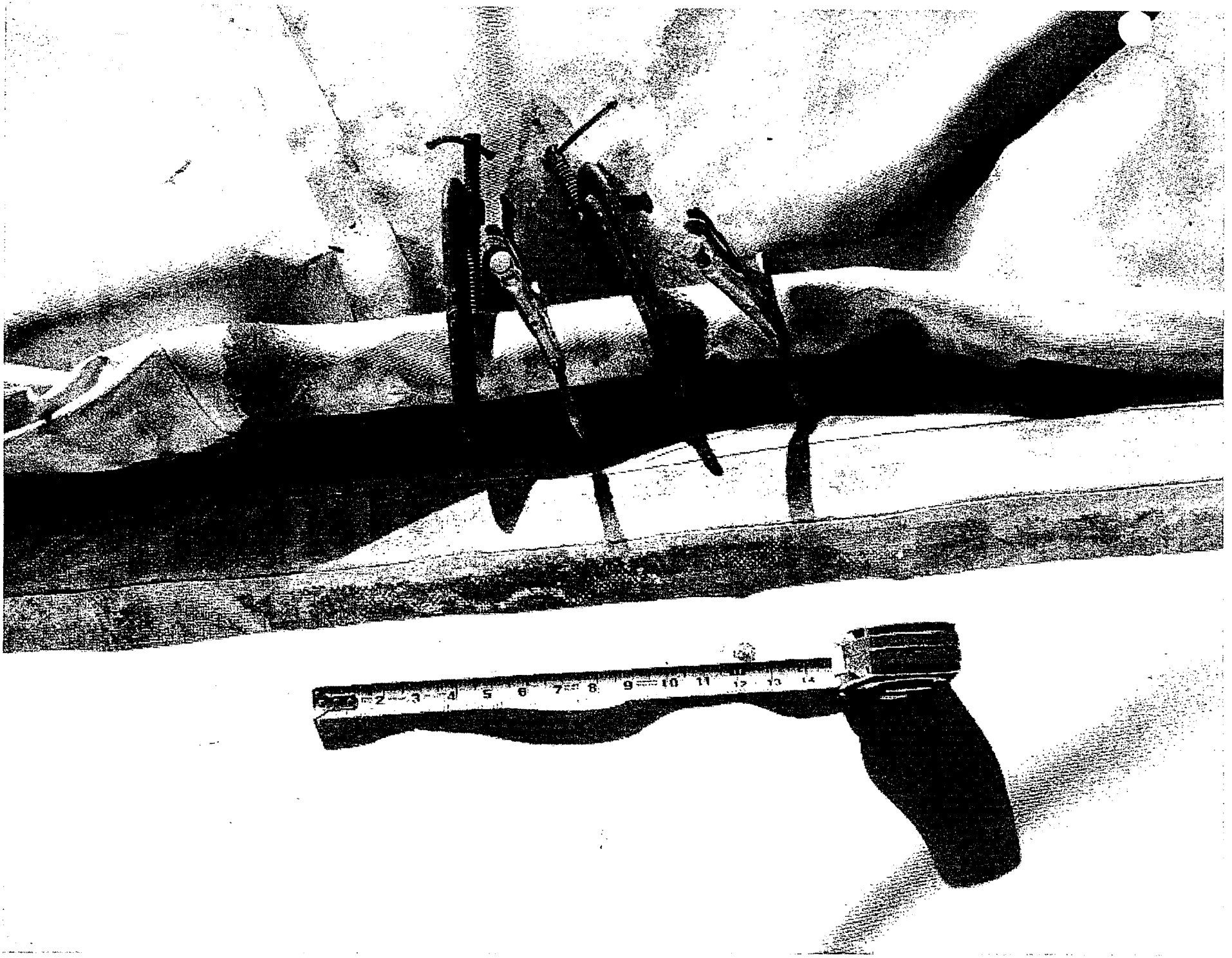


Exhibit 2

ARTICLE 5. MINIMUM DESIGN CRITERIA

Article 5, consisting of R18-5-501 through R18-5-509, recodified from 18 A.A.C. 4, Article 5 at 10 A.A.R. 585, effective January 30, 2004 (Supp. 04-1).

R18-5-501. Siting Requirements

To the extent practicable, a new public water system or an extension to an existing public water system shall be geographically located to avoid a site which is:

1. Subject to a significant risk from earthquakes, floods, fires, or other disasters which could cause a breakdown of the public water system or portion thereof; or
2. Within the flood plain of a 100-year flood, except for intake structures and properly protected wells.

Historical Note

Section recodified from R18-4-501 at 10 A.A.R. 585, effective January 30, 2004 (Supp. 04-1).

R18-5-502. Minimum Design Criteria

A. A public water system shall be designed using good engineering practices. A public water system which is designed in a manner consistent with the criteria contained in Engineering Bulletin No. 10, "Guidelines for the Construction of Water Systems," issued by the Arizona Department of Health Services, May 1978 (and no future editions), which is incorporated herein by reference and on file with the Office of the Secretary of State, shall be considered to have been designed using good engineering practices. Other system designs shall be approved if the applicant can demonstrate that the system will function properly and may be operated reliably in compliance with this Chapter. Minimum design criteria which are not subject to modification are listed in this Section.

B. A potable water distribution system shall be designed to maintain and shall maintain a pressure of at least 20 pounds per square inch at ground level at all points in the distribution system under all conditions of flow.

C. Water and sewer mains shall be separated in order to protect public water systems from possible contamination. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. Separation requirements are as follows:

1. A water main shall not be placed:
   a. Within 6 feet, horizontal distance, and below 2 feet, vertical distance, above the top of a sewer main unless extra protection is provided. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided. Alternate extra protection shall consist of encasing both the water and sewer mains in at least 6 inches of concrete for at least 10 feet beyond the area covered by this subsection (C)(1)(a).
   b. Within 2 feet horizontally and 2 feet below the sewer main.
2. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be 6 feet, measured from the center of the manhole.
3. The minimum separation between force mains or pressure sewers and water mains shall be 2 feet vertically and 6 feet horizontally under all conditions. Where a sewer force main crosses above or less than 6 feet below a water line, the sewer main shall be encased in at least 6 inches of concrete or constructed using mechanical joint ductile iron pipe for 10 feet on either side of the water main.
4. The separation requirements do not apply to building, plumbing, or individual house service connections.
5. Sewer mains (gravity, pressure, and force) shall be kept a minimum of 50 feet from wells unless the following conditions are met:

a. Water main pipe, pressure tested in place to 50 psi without excessive leakage, is used for gravity sewers at distances greater than 20 feet from water wells; or

b. Water main pipe, pressure tested in place to 150 psi without excessive leakage, is used for pressure sewers and force mains at distances greater than 20 feet from water wells. "Excessive leakage" means any amount of leakage which is greater than that permitted under the AWWA Standard applicable to the particular pipe material or valve type.

6. Requests for authorization to use alternate construction techniques, materials, and joints shall be reviewed by the Department, and such requests may be approved on a case-by-case basis.

D. A public water system shall not construct or add to its system a well which is located:

1. Within 50 feet from existing sewers unless the sewer main has been constructed in accordance with subsection (C)(5)(a) or (b) of this Section;
2. Within 100 feet of any existing septic tank or subsurface disposal system;
3. Within 100 feet of a discharge or activity which is required to obtain an Individual Aquifer Protection Permit, pursuant to A.R.S. §§ 49-241(A) through 49-251;
4. Within 100 feet of an underground storage tank as defined in A.R.S. § 49-1001; or
5. Within 100 feet of hazardous waste facilities operated by large quantity generators and treatment, storage, and disposal facilities regulated under the Arizona Hazardous Waste Management Act, A.R.S. § 49-921 et seq.

Historical Note

Section recodified from R18-4-502 at 10 A.A.R. 585, effective January 30, 2004 (Supp. 04-1).

R18-5-503. Storage Requirements

A. The minimum storage capacity for a CWS or a noncommunity water system that serves a residential population or a school shall be equal to the average daily demand during the peak month of the year. Storage capacity may be based on existing consumption and phased as the water system expands.

B. The minimum storage capacity for a multiple-well system for a CWS or a noncommunity water system that serves a residential population or a school may be reduced by the amount of the total daily production capacity minus the production from the largest producing well.

Exhibit 3

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S REQUESTS
DATED APRIL 23, 2014
(FOURTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 2, 2014

JL 4.1 CWC sold total of 721,654,000 gallons water in 2013 with 12,958 customers, and sold 831,899,400 gallons in 2007 with 11,854 customers. Therefore, CWC's customers used 110,245,400 gallons less water in 2013 with 1,104 more customers. Please explain in details why?

Response:

CWC believes that the decrease in water consumption is the result of many factors including higher water bills and sewer bills that have motivated customers to reduce water consumption, CWC and customer conservation efforts, appliance efficiencies, reduction in pools, and impact of the economic downturn that continues to some degree. CWC is not in a position to determine whether these are permanent or cyclical changes.

Respondent: John Meyer and Arturo Gabaldon

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S REQUESTS
DATED APRIL 23, 2014
(FOURTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 2, 2014

JL 4.2 Please see attached water storage calculations. It shows CWC has adequate production capacity and storage capacity to serve the existing customer base and reasonable growth after Company's existing reservoir #2 is removed without replacement. Please let us know if you agree.

Response:

CWC disagrees that there is adequate storage capacity after removing reservoir #2. Further, CWC does not concur that production capacity should be used as a substitute for water storage. CWC assumes for planning purposes that a major power outage is in effect and no production is possible. CWC wells run on electricity only and wells do not have stand-by power generation capabilities. CWC plans for numerous other contingencies including when the Company takes a well or reservoir out of service to perform routine maintenance for example. Its planning is based on overall reliability of CWC's system that has been in place and evolved over time.

Further, CWC does not agree with some of the figures and assumptions ACC Staff uses to make its calculations. Below are CWC's proposed adjustments to ACC Staff's calculations and assumptions in its question:

1. Production capacity without backup power generating capabilities should not be included when calculating storage capacity, see Arizona Department of Environmental Quality Engineering Bulletin 10, Chapter 6, section D "capacity."
2. CWC target for emergency storage requirement is 48 hours of average day based on standards set forth in the Handbook on Water Systems 2nd Edition HDR Engineering Inc. © 2001 ("Capacity" page 957) "... a minimum emergency storage volume would be enough to supply two days [48-hours] of average demand in the area served by the storage facility."
3. Based on 2013 total water produced a 48-hour average demand in the CWC area is 4,453,037 gallons.
4. CWC believes that using the December 31, 2013 customer count is too low and proposes the following projected June 2014 numbers. CWC is prepared to provide actual numbers when available.
5. Water use should be based on gallons pumped and not gallons sold. It is reasonable to expect that unaccounted for and system use water is an inherent element of water consumption and should be factored into the analysis.
6. Based on ACC formula applying CWC adjustments noted, the peak day of peak month projected use (the day where demand for water from CWC customers is at its highest) can reasonably be estimated to be at least 3,200,504 gallons.

Based on CWC's adjustments, it projects the number of customers to be approximately 12,992 at June 2014, which affects both the average and peak day projected use within the peak month, as shown in Table 1:

Table 1

System Requirements
Peak month divided by 30 adjusted for peak day

Customer Counts	Dates	Peak Day of Peak Month ACC	Peak Day of Peak Month CWC	Average Day of Peak Month	Average Day of Year 2013
Number of customers at Jan 2013			12,868	12,868	12,868
Number of customers at June 2013		12,902	12,902	12,902	12,902
2013 6 month Increase			34	34	34
Number of customers at Dec 2013		12,958	12,958	12,958	12,958
Number of customers projected to June 2014			12,992	12,992	12,992
Water Use					
Gallons of water sold June 2013 (ACC basis)		69,556,000			
Gallons of water produced in the year 2013					795,994,000
Gallons of water produced June 2013 (CWC basis)			76,280,000	76,280,000	
Number of customers June 2013		12,902	12,902	12,902	12,902
Average gallons per customer for a month		5,391	5,912	5,912	5,141
Gallons per customer per day (/30)		180	197	197	171
Peak factor (per day x 1.25)		225	246	-	-
Number of customers at Dec 2013		12,958	-	-	-
Number of customers projected to June 2014		-	12,992	12,992	12,992
Avg day of 2013 (based on produced CWC)					2,226,518
Avg day of peak month (based on prod CWC)				2,560,403	
Peak day of peak month (based on prod CWC)			3,200,504		
Peak day of peak month (based on sold ACC)		2,910,746			
Hourly projected water requirement (gallons)		121,281	133,354	106,683	92,772
48-Hours supply		5,821,492	6,401,009	5,120,807	4,453,037

Reservoir storage components are described on Table 2; volume is allocated for overflow, operations, equalizing, emergency and dead storage, based on standards set forth in the Handbook on Water Systems ("Capacity" figure 27-1 on page 955).

Table 2

Storage Component Breakdown (Gallons)

Reservoir Number	#1	#2 (Current)	#3	#4	Well 10 Forebay	Well 11 Forebay
Overflow less 1 ft	129,000	207,000	83,000	167,000	37,500	37,500
Normal Operating	156,000	180,000	250,000	500,000	37,500	131,250
Equalizing	222,000	222,000	250,000	500,000	50,000	37,500
Emergency	493,000	347,000	417,000	583,000	75,000	18,750
Dead	-	44,000	0	250,000	100,000	75,000
Total Design in Gallons	1,000,000	1,000,000	1,000,000	2,000,000	300,000	300,000
Average Operating Storage	793,000	659,000	792,000	1,333,000	143,750	121,875
AOS Percent of Design	79%	66%	79%	67%	48%	41%

Storage Component Breakdown (Feet of Water)

Reservoir Number	#1	#2 (Current)	#3	#4	Well 10 Forebay	Well 11 Forebay
Overflow less 1 ft	1.5	2.0	2.0	2.0	1.5	2.0
Normal Operating	2.0	2.0	6.0	6.0	1.5	7.0
Equalizing	3.0	3.0	6.0	6.0	2.0	2.0
Emergency	8.0	7.5	10.0	7.0	3.0	1.0
Dead	0.0	1.5	0.0	3.0	4.0	4.0
Total Design in Feet	14.5	16.0	24.0	24.0	12.0	16.0
Average Operating Storage	12.0	11.5	19.0	16.0	5.8	6.5
AOS Percent of Design	83%	72%	79%	67%	48%	41%

Storage Component Breakdown (Percent)

Reservoir Number	#1	#2 (Current)	#3	#4	Well 10 Forebay	Well 11 Forebay
Overflow less 1 ft	13%	21%	8%	8%	13%	13%
Normal Operating	16%	18%	25%	25%	13%	44%
Equalizing	22%	22%	25%	25%	17%	13%
Emergency	49%	35%	42%	29%	25%	6%
Dead	0%	4%	0%	13%	33%	25%
Total Design	100%	100%	100%	100%	100%	100%

Note - Component breakdown description per Handbook on Water Systems 2nd Edition HDR Engineering Inc. © 2001 ("Capacity" page 955 figure 27-1.)

The lowest operating levels include the equalizing and emergency water storage: this is labelled "Lowest Operating Storage", average operating includes 50% of operating storage. Table 2 also

show storage component breakdown (gallons) for each reservoir and forebay in the CWC system. Forebays were designed to operate as a buffer between the well pumps and the boosters.

Based on the calculations below, the removal of reservoir #2 (Table 3 column A) will bring total available storage at average operating storage levels for emergencies and equalization to 3,183,625 gallons, which is below 4,453,037 gallons, its storage target, and below its 3,200,504 gallon peak day of peak month. Using average operating storage CWC would have 34 hours of storage for average usage, which is below its 48-hour emergency supply target.

CWC believes it is prudent to remove reservoir #2, based on its vulnerability to contamination, safety and security considerations. The reservoir is located in a remote desert area west of the service area. In the mid 1980's the reservoir had been subject of vandalism (knife cut), which could not have happened with a steel tank.

Should reservoir #4 (its largest remaining reservoir) go offline (Table 3 column B), the total available storage at average operating storage levels for emergencies and equalization is 1,850,625 gallons, or 20 hours of storage to meet the average day demands.

Table 3

Existing System Storage and Removal of Reservoir #2

					A	B
Storage Available	Design Capacity	Lowest Operating Storage (LOS)	Average Operating Storage (AOS)	Maximum Operating Storage (MOS)	Reservoir #2 Removed (AOS)	Res. #4 Offline & Reservoir #2 Removed (AOS)
Reservoir #1	1,000,000	715,000	793,000	871,000	793,000	793,000
Reservoir #2	1,000,000	569,000	659,000	749,000	-	-
Reservoir #3	1,000,000	667,000	792,000	917,000	792,000	792,000
Reservoir #4	2,000,000	1,083,000	1,333,000	1,583,000	1,333,000	-
Well 10 Forebay	300,000	125,000	143,750	162,500	143,750	143,750
Well 11 Forebay	300,000	56,250	121,875	187,500	121,875	121,875
Total	5,600,000	3,215,250	3,842,625	4,470,000	3,183,625	1,850,625
Hrs of storage (Avg Day of Peak Mo)		30	36	42	30	17
Hrs of storage (Peak Day of Peak Mo)		24	29	34	24	14
Hrs of storage (Avg Day of Year)		35	41	48	34	20

CWC also considered and rejected replacing reservoir #2 with a 1,000,000 gallon above ground steel tank (Table 4 column C). At average operating storage levels this will bring total available storage for emergencies and equalization to 3,842,625 gallons, which is below 4,453,037 gallons, its storage target. Using average operating storage CWC would have 41 hours of storage for average usage, which is below its 48-hour emergency supply target.

Should reservoir #4 (its largest remaining reservoir) go offline (Table 4 column D), the total available storage using average operating storage levels for emergencies and equalization is 2,509,625 gallons, or 27 hours of storage to meet average day demands. This would leave CWC vulnerable in the case of a prolonged power outage.

Table 4

Replace Reservoir #2 with 1,000,000 Gallon Above Ground Steel Tank

			C			D
Storage Available	Design Capacity	Lowest Operating Storage (LOS)	Average Operating Storage (AOS)	Maximum Operating Storage (MOS)	Reservoir #4 Offline (LOS)	Reservoir #4 Offline (AOS)
Reservoir #1	1,000,000	715,000	793,000	871,000	715,000	793,000
Reservoir #2 @ 1M Steel	1,000,000	569,000	659,000	749,000	569,000	659,000
Reservoir #3	1,000,000	667,000	792,000	917,000	667,000	792,000
Reservoir #4	2,000,000	1,083,000	1,333,000	1,583,000	-	-
Well 10 Forebay	300,000	125,000	143,750	162,500	125,000	143,750
Well 11 Forebay	300,000	56,250	121,875	187,500	56,250	121,875
Total	5,600,000	3,215,250	3,842,625	4,470,000	2,132,250	2,509,625
Hrs of storage (Avg Day of Peak Mo)		30	36	42	20	24
Hrs of storage (Peak Day of Peak Mo)		24	29	34	16	19
Hrs of storage (Avg Day of Year)		35	41	48	23	27

A 2,000,000 gallon above ground steel tank replacement of reservoir #2 (Table 5 column E) at average operating storage levels would bring total available storage for emergencies and equalization to 4,516,625 gallons, which provides significantly more assurance CWC can supply water to its customer base in an emergency situation. Using average operating storage for average day usage CWC would have 49 hours of storage for average usage, which meets its 48-hour emergency supply target.

Should reservoir #4 (its largest remaining reservoir) go offline (Table 5 column F), the total available storage at average operating storage levels for emergencies and equalization is 3,183,625 gallons, or 34 hours of storage to meet average usage demands.

Further, the opportunity to double the capacity of reservoir #2 at this time for an incremental increase in cost will better protect the system from long-term power outages. The average age of CWC's customers (many of whom are retirees) makes them particularly vulnerable to water outages. The benefits to replacing reservoir #2 with a 2,000,000 gallon storage facility (and the long-term security it brings) significantly outweighs the incremental cost of the additional capacity in CWC's view.

Table 5

Replace Reservoir #2 with 2,000,000 Gallon Above Ground Steel Tank

			E			F
Storage Available	Design Capacity	Lowest Operating Storage (LOS)	Average Operating Storage (AOS)	Maximum Operating Storage (MOS)	Reservoir #4 Offline (LOS)	Reservoir #4 Offline (AOS)
Reservoir #1	1,000,000	715,000	793,000	871,000	715,000	793,000
Reservoir #2 @ 2M Steel	2,000,000	1,083,000	1,333,000	1,583,000	1,083,000	1,333,000
Reservoir #3	1,000,000	667,000	792,000	917,000	667,000	792,000
Reservoir #4	2,000,000	1,083,000	1,333,000	1,583,000	-	-
Well 10 Forebay	300,000	125,000	143,750	162,500	125,000	143,750
Well 11 Forebay	300,000	56,250	121,875	187,500	56,250	121,875
Total	6,600,000	3,729,250	4,516,625	5,304,000	2,646,250	3,183,625
Hrs of storage (Avg Day of Peak Mo)		35	42	50	25	30
Hrs of storage (Peak Day of Peak Mo)		28	34	40	20	24
Hrs of storage (Avg Day of Year)		40	49	57	29	34

An example of how additional capacity could assist CWC to resolve service issues occurred on February 3, 2011 at approximately 9 a.m. At that time, CWC experienced a 6" fire sprinkler break, which resulted in the loss of more than 750,000 gallons of water within 6 hours. CWC was alerted by its SCADA system and operators were mobilized to investigate the service area to identify the possible causes of the sudden drain in water supplies. The leak was ultimately reported by a customer. Operators noted how vulnerable the reservoirs were to sudden leaks, and felt fortunate that the break occurred during working hours. Had the incident happened at night or on a weekend, the response time may have been delayed, causing serious damage to the system infrastructure, as well as water shortages in the system.

Put simply, CWC's system has been based on having four wells and four reservoirs (storage facilities) from a systems reliability perspective. This means that the system has been designed based on these components in service. The design has served CWC and its customers well for over 37 years. To simply remove one component significantly changes the system design and puts the system at greater risk of a major event leading to customers not having water more frequently and for a greater period of time. CWC believes this is an unacceptable approach because it does not conform to its best management practices. Further, the above event demonstrates our need to increase water storage facilities. Based on the above CWC believes it is reasonable to replace reservoir #2 with the proposed aboveground storage tank and increase storage capacity.

Thus, CWC has several justifications to replace the existing reservoir #2 with the proposed aboveground storage tank beyond simply looking at production as an alternative to storage.

Reservoir #2 should be replaced with an aboveground 2,000,000 gallon steel tank to eliminate the following deficiencies:

1. Vulnerability to contamination (vandalism, terrorism, over filling)
2. Increasing maintenance cost
3. Operational challenges
4. Water quality challenges
5. Employee safety concerns

The following are excerpts from various water utility emergency preparedness articles and government agencies regarding the importance of having ample storage in a prolonged outage or natural disaster.

1) "Many utilities have taken steps to identify their vulnerability to power loss and have taken preventive action, such as increasing storage capacity and using backup power strategies to ensure continued operations." ('Superstorm Sandy After Action Report'; Water/Wastewater Agency Response Network, © 2013 American Water Works Association at page 3.)

2) "Jackson said the guiding thought behind the recovery is that without a sufficient supply of water and a functioning wastewater system and effective drainage system, there is no city. 'It has practically become a mantra of ours,' Jackson said, cautioning that many others 'don't really get it yet." ("Katrina Stories Highlight New Realities of Disaster Planning"; Water Beat.) © 2006 American Water Works Association at page 22.)

3) "Assess the significance of extended outages - Multi-agency emergency water supply plans should include an assessment as to recovery periods being extended due to critical spare parts not being available for long durations and the time for restoring critical infrastructure to functional condition. Consequently, provision of potable water and other measures will be required for greater durations than those conventionally planned." ("Planning for Emergency Drinking Water Supply"; EPA 600/R-11/054 June 2011 at page 31.)

4) "The recovery period would likely be of a long duration since events that impact drinking water systems also have profound primary impacts on other infrastructure (e.g., power, transportation, communications) and secondary impacts (e.g., disruption to supply chains, mobility difficulties, security concerns, human-resource depletion). ("Planning for Emergency Drinking Water Supply"; EPA 600/R-11/054 June 2011 at page 38.)

5) "Treatment operations resiliency (percent): Percent of minimum daily demand met with the primary production or treatment plant offline for 24, 48, and 72 hours. (Note: "minimum daily demand" is the average daily demand for the lowest production month of the year.) ("A Primer for Water and Wastewater Utilities" American Water Works Association, © 2008, at page 39.) This illustrates the need to consider 48 and 72 hours of emergency storage even under minimum demands and lowest production levels.

Respondents: John Meyer and Arturo Gabaldon

Exhibit 4

SMYTH INDUSTRIES

4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719
(520) 750-9544

Load Summary	
Well Pump (400HP)	477
Booster Pump #1 (100HP)	124
Booster Pump #2 (100HP)	124
Booster Pump #3 (100HP)	124
Booster Pump #4 (100HP)	124
Booster Pump #5 (100HP)	124
20/240 Volt XFMR (10KVA)	20.8
Sub Total:	1117.8
25% Largest Motor	119.25
Total:	**1237.05**
Well Pump (350HP)	414
Booster Pump #1 (125HP)	156
Booster Pump #2 (125HP)	156
Booster Pump #3 (125HP)	156
Booster Pump #4 (125HP)	156
Booster Pump #5 (125HP)	156
20/240 Volt XFMR (10KVA)	20.8
Sub Total:	1214.8
25% Largest Motor	103.5
Total:	**1318.3**

Exhibit 5

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S VERBAL REQUESTS
DATED MAY 7, 2014
(FIFTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 13, 2014

STF 5.1 What is the price difference between a 1 million gallon and a 2 million gallon above ground storage tank, of similar design?

Response:

The price difference is estimated at $197,814, see below:

	2 Million Gallons	1 Million Gallons	Difference	Percent 1MG
Total Tank Bid	875,660	710,000	165,660	23%
Taxes @ 6.1%	53,415	43,310	10,105	23%
Controls Reconfiguration	15,000	15,000	-	0%
Flowmeters	15,500	15,500	-	0%
Fencing	33,434	33,434	-	0%
Atty. Fees	20,000	20,000	-	0%
Overhead (5%)	51,000	42,100	8,900	21%
Contingency	131,491	118,342	13,149	11%
Surveying	4,500	4,500	-	0%
Total	1,200,000	1,002,186	197,814	20%
verage Operating Storage (Gallons)	1,333,000	666,500	666,500	100%
Cost per AOS gallons	0.90	1.50	0.60	40%
Cost per design gallons	0.60	1.00	0.40	40%

Quotes are attached.

Respondent: John Meyer

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S VERBAL REQUESTS
DATED MAY 7, 2014
(FIFTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 13, 2014

STF 5.2 What are CWC's concerns regarding emergency generators located at the well-sites?

Response:

Safety Concerns:

CWC has concerns for employee safety. A review of our well sites indicates that the well 11 site may not be large enough to accommodate a sufficiently-sized generator. An inappropriate space for maintenance and inspection would create an unsafe work environment. An above ground storage facility will not require additional land.

Further, CWC well sites are located in residential areas, the use of large quantities of combustible fuels (either natural gas or diesel) in residential area will increase the potential risk to the community. An above ground storage facility provides direct available water supplies and greater security.

Operational Cost/Rate Concerns:

CWC is concerned that there would not be sufficient fuel supplies to meet our emergency needs. Forebays have approximately a 10-hour fuel supply; alternative power supplies for wells would have a similar limitation. CWC has no stand by fuel supplies in a major power outage. An above ground storage facility will rely on being filled when electricity is available.

CWC has concerns about natural gas supplies. Availability of natural gas in the area of the wells is unknown. Gas utility may require larger delivery lines. An above ground storage facility will not rely on alternative fuel sources.

CWC has concerns about the impact on operations. In the late 1970's and early 1980's Community Water Company stored gasoline at its warehouse facility for use by its service vehicles. The operating costs required from the regulations outweighed the savings from purchasing fuel in bulk. Further, regulatory and permitting requirements may be implicated, which adds to operational costs. An above ground storage facility will not rely on alternative fuels.

CWC is concerned about increasing the complexity of operating the system, which would increase employee training and wage costs. This would affect rate payers.

CWC has concerns about the impact on operating costs. Storage requirements of diesel fuel to retain its usefulness are unknown. Unused fuel may have to be dumped or used, resulting in

higher operating costs on water on rate payers. An above ground storage facility will not increase operating costs.

Respondents: John Meyer and Arturo Gabaldón

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S VERBAL REQUESTS
DATED MAY 7, 2014
(FIFTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 13, 2014

STF 5.3 Please provide any records regarding past power failures to CWC.

Response:

CWC does not have records of power failures in its possession. Management has attempted to inquire with TEP but has not yet received a response.

Respondent: John Meyer and Arturo Gabaldón

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S VERBAL REQUESTS
DATED MAY 7, 2014
(FIFTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 13, 2014

STF 5.4 Please explain the need for the new storage facility based on CWC's planning. What are CWC's overall concerns?

Response:

CWC is planning for a major event (such as a power failure) that would adversely impact its entire system, and its ability to provide safe and reliable service to its customers. CWC management and staff are responsible for the delivery of suitable water to a population of over 22,000 persons (almost 13,000 customers) many of whom are retirees 75 years old or older. This population is especially vulnerable, which is the basis for a 48-hour supply of water based on average use, before curtailment measures would have to be put into effect. CWC continues to work with local emergency management organizations to develop plans in case of such an event, in addition to ensuring a reliable water supply in accordance with its best practices.

Respondent: John Meyer and Arturo Gabaldón

COMMUNITY WATER COMPANY
OF GREEN VALLEY'S
RESPONSES TO STAFF'S VERBAL REQUESTS
DATED MAY 7, 2014
(FIFTH SET OF DATA REQUESTS)
DOCKET NO. W-02304A-14-0041
Dated May 13, 2014

STF 5.4 What does a backup generator cost?

Response:

Per quote from Barney Foster at Simonsen, Generator Service, Inc. (520-889-9581) the cost of a 500 KW Natural Gas Unit with ATS is $210,000.

Respondent: John Meyer

COMMUNITY WATER COMPANY OF GREEN VALLEY'S RESPONSES TO STAFF'S SECOND SET OF DATA REQUESTS DOCKET NO. W-02304A-14-0041 Dated March 10, 2014

JL 2.1 New Storage Tank — Please provide a copy of engineering report regarding the need for the new storage tank. This report should be signed by a licensed professional engineer in the State of Arizona, and include following:

a. Submit a cost estimate with sufficient detail to the proposed new aboveground storage tank;

b. Provide professional engineering opinion regarding the existing Reservoir 42, and compare the costs and benefits to repair the existing Reservoir #2 vs. replace it.

RESPONSE: See attached.

Respondent: John Meyer, CWCGV Treatment Supervisor

SMYTH STEEL MANUFACTURING, INC.
4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719
(520) 750-9544

March 17, 2014

To: John Meyer
Re: 2.0MG Reservoir

We are pleased to offer the following proposal to fabricate and install a new 2.0MG water storage tank and associated piping per AWWA D100-96. Said tank will be 120'Ø x 24' tall.

<u>One 2.0 MG steel water storage tank, 120' diameter x 24' height</u>

Includes:

- One roof vent and roof access hatch
- Shell man-ways
- One overflow, inlet and outlet piping
- Gauge board
- Interior and exterior ladder
- NSF approved interior and exterior coatings
- Installation of concrete tank base
- Installation of gravel
- Shop drawings

Excludes: Valves, flow meters, site piping, etc.
Taxes, Bonds and Permits

Price - $742,900

<u>Add Alternate:</u>

- Fabricate and install 60 LF of 16" carbon steel mixing pipe with 4 pipe stands and painted.

Price - $5,960

<u>Site Work</u>

Includes:

- Remove and haul off existing block wall
- Remove existing Hypalon tank liner
- Backfill existing reservoir (pricing assumes adequate material available on site to complete pad, no import material)
- Compaction testing of backfill by geotechnical consultant
- Install 16" piping inlets/outlets to the new tank and connect to existing system

SMYTH STEEL MANUFACTURING, INC.
4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719
(520) 750-9544

Excludes:

- Taxes, bonds and permits
- Backflow preventer(s)
- Flow meter(s)

Price - $126,800

Due to the volatility of the steel and fuel markets, this quote is valid for 30 days from the above date. We will need to order and bill for material upon receipt of a purchase order.

If you have any questions please do not hesitate to contact our office.

Respectfully submitted,

Accepted

By:_____
Gary Smyth
President
Date:_____

Preliminary Schedule Of Values

Project: Continental Road Reservoir Improvements - 2 MG Storage Tank

Prepared For: Community Water

Prepared By: Smyth Industries, INC.

REVISED: March 17, 2014

Item No.	Description	Amount	Units	Total
1	Survey	1	EA	$2,000
2	Geotechnical Site Evaluation & Materials Testing	1	EA	$12,000
3	Structural Design	1	EA	$5,000
4	Demo, Grading & Backfill	1	EA	$69,600
5	Underground Piping	1	EA	$38,200
6	Tank Mixing Pipe	1	EA	$5,960
7	2 MG Welded Steel Tank per AWWA Standards	1	EA	$742,900

Notes:

1) Due to the volatilty of the steel and fuel markets, this proposal is valid for 30 days from the date listed above.

2) This proposal addresses the increased costs of tank coatings and the underground piping installation having no backflow prevention devices.

SMYTH INDUSTRIES INC.
4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719 Phone | (520) 750-9544 Fax

July 1, 2014

Community Water Company of Green Valley
1501 S. La Canada Dr.
Green Valley, AZ 85622

Dear Community Water,

This letter is in response to your request for Smyth Industries to evaluate the two options being considered to replace the existing hypalon tank at the Reservoir #2 site on Continental Road. The two options being considered are:

1. Install a new above-ground welded steel potable water storage tank.
2. Replace the existing below-ground hypalon tank.

We conclude that there are many advantages gained with the construction of a welded steel tank, including health and safety, cost, security, and maintenance while there are only minimal benefits gained with the installation of a new hypalon tank. The pros and cons are described in greater detail below.

Cost

The approximate cost to replace the Reservoir #2 hypalon tank is $500,000 and the estimated service life of that tank is 12-13 years. The cost of the new welded steel tank is about $1,000,000 with an estimated service life of 30 years. The cost per year of the hypalon tank is about $38,000-42,000 while the cost per year of the welded steel tank is about $33,000-34,000. Additionally the hypalon tank would require about 250 man hours of maintenance annually for the following actions:

- Dewatering the hypalon cover after rainfall
- Cleaning the hypalon cover
- Maintaining the motor operated valve
- Maintaining the pressure pump
- Maintaining the control system

The maintenance required for steel tanks is usually repair of the interior coatings. Typically these repairs are under warranty for the first 2 years of service. After warranty, about every 8-10 years coating maintenance is required at a cost of about $5,000-$10,000, and a full recoating of the tank interior may be needed after 15-20 years at a rough cost of about $100,000.

Health and Safety

During site visits we observed and noticed the existing hypalon tank cover (which is at ground level and exposed to the elements) has been repaired, likely due to splitting or vandalism. These penetrations of the hypalon cover allow for contaminants to enter the tank prior to their repair.

SMYTH INDUSTRIES INC.
4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719 Phone | (520) 750-9544 Fax

Additionally the connection of the hypalon tank cover to the concrete ring at the edge of the tank is made via plates and bolts. Said connection is not likely watertight which may permit contaminants to enter the tank via rainwater runoff. This is of concern when considering the proximity to the existing mine and desert animal fecal material. Another safety concern is that there is no way to inspect the inside of the hypalon tank, and Community Water has been unable to contract a certified diver to inspect the inside of the tank to date.

A welded steel tank would eliminate all of the health and safety concerns described above.

Hydraulic Advantages

As mentioned prior, the existing hypalon tank is a below-ground storage vessel. Per plan documents provided by Community Water the bottom of the existing tank is 16-feet below ground surface. This requires that the inlet/outlet is at that level as well which reduces the amount of available head pressure within the system. Also the shared inlet/outlet in the existing system results in poor water exchange or circulation within the tank leading to stagnation and less desirable water quality.

An above-ground welded steel tank would increase the amount of head pressure available within the system and based on the information provided by Community Water it would reduce pumping costs at well #10. It would also allow for the elimination of the pressure pump at this site and create a redundant source of water pressure within the distribution system.

Additionally the welded steel tank design would include an inlet and outlet with at least 90-degrees of separation between which would increase circulation in the tank, thereby increasing water quality. Another benefit resulting from the above ground steel tank is that the Reservoir #2 site would then be under positive pressure which is generally more secure against contamination.

If you have any questions, comments, or concerns regarding the opinions and recommendations described herein please contact Smyth Industries.

Sincerely,

Jesse Schultz, PE
Project Manager

SMYTH INDUSTRIES

4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719
(520) 750-9544

Raul Pina CPE Consultants
Re: Community Water Generator Quotes
Date: August 8, 2014

Natural Gas Generator: $1,135,318.00 (per site)

- Furnish and install (1) new 1000kW Natural Gas Generator.
  - Automatic Transfer Switch.
  - Natural Gas Engine (exceeds 48hr runtime requirement).
  - Sound Attenuated Enclosure.
  - Wire from the SES to the Transfer Switch and continued to the power distribution blocks in the wireway to feed the pump panels.
  - Conduit and necessary appurtenances.

Diesel Generator: $466,568.00 (per site)

- Furnish and install (1) new 1000kW Diesel Generator.
  - Automatic Transfer Switch.
  - 48 Hour Diesel Storage.
  - Sound Attenuated Enclosure.
  - Wire from the SES to the Transfer Switch and continued to the power distribution blocks in the wireway to feed the pump panels.
  - Conduit and necessary appurtenances.

Exclusions:

- Permits
- Site Work
- Concrete Pads
- Taxes
- Modifications to electrical rack for the transfer switch.

Thank you,

Ray Rogers
Project Manager
Ray@SmythSteel.com
Office 520.750.8719

License #ROC154663 A-General Engineering
License #ROC171540 L-11 Electrical
ASME Boiler and Pressure Vessel 'U' Certified
The National Board of Boiler and Pressure Vessel Inspectors 'R' Certified
UL 508A Manufacturing #E306021

SMYTH INDUSTRIES

4010 E. Illinois St.
Tucson, AZ 85714
(520) 750-8719
(520) 750-9544

Load Summary	
Well Pump (400HP)	477
Booster Pump #1 (100HP)	124
Booster Pump #2 (100HP)	124
Booster Pump #3 (100HP)	124
Booster Pump #4 (100HP)	124
Booster Pump #5 (100HP)	124
20/240 Volt XFMR (10KVA)	20.8
Sub Total:	1117.8
25% Largest Motor	119.25
Total:	**1237.05**
Well Pump (350HP)	414
Booster Pump #1 (125HP)	156
Booster Pump #2 (125HP)	156
Booster Pump #3 (125HP)	156
Booster Pump #4 (125HP)	156
Booster Pump #5 (125HP)	156
20/240 Volt XFMR (10KVA)	20.8
Sub Total:	1214.8
25% Largest Motor	103.5
Total:	**1318.3**

License #ROC154663 A-General Engineering
License #ROC171540 L-11 Electrical
ASME Boiler and Pressure Vessel 'U' Certified
The National Board of Boiler and Pressure Vessel Inspectors 'R' Certified
UL 508A Manufacturing #E306021

EMPIRE POWER SYSTEMS
3830 N. Highway Drive
Tucson, AZ 85705

Steve Maddox

Steve Maddox
Empire Power Systems
520-407-3106 Office, 520-955-3106 Mobile, steve.maddox@empire-cat.com

BILL OF MATERIALS

Caterpillar Components Features
101 I 1 LV0011 G3516 PGS 1800 RPM HIGH CR
Sub-items 102 to 104 belong to item 101
102 I 1 4385936 GENERAL AR
103 I 1 4356444 ENGINE AR-GENSET
104 I 1 1441696 GENERATOR AR-PWR (A679)
105 I 1 5N9597 VOLTAGE INDICATOR 480V, 60HZ
106 I 1 3571662 CERTIFICATION GP (EU)
107 I 1 0V1065 END USE: GENERAL EPG
108 I 1 1214713 ENGLISH DISPLAY UNITS
109 I 1 9Y8156 NOTE - STAMP FOR STANDBY POWER
110 I 1 1214712 PANEL LIGHTS/AUXILIARY RELAY
111 S 1 1315451 2301A SPEED CONTROLLER
112 I 1 3612453 CONVERSION GP-S (LVEB)(EC)
113 I 1 LE0617 SPACE HEATER RELAY
114 I 1 5Z3333 ***SPECIAL SETTING REQUEST****
115 I 1 3729106 COVER GP
116 I 1 LE7827 LUBE OIL - DRAIN PRIOR TO SHIP
200 I 1 0V8707 G3516A STANDBY W/ AFRC & RAD
300 I 1 1441696 GENERATOR AR-PWR (A679) L
400 I 1 1441692 GENERATOR AR-PWR (A678)
500 I 1 0V2319 DTO- CONTROL GP (AFRC)
600 I 1 0V2319 DTO - HARNESS GP - WRG
700 I 1 0V2319 DTO - HARNESS GP - WRG
800 I 1 LV0011 G3516 PGS 1800 RPM HIGH CR L
Sub-items 801 to 803 belong to item 800
801 I 1 4385936 GENERAL AR L
802 I 1 4356444 ENGINE AR-GENSET L
803 I 1 1441696 GENERATOR AR-PWR (A679) L
900 I 1 LV0023 G3516 PGS 1800 RPM HIGH CR
Sub-items 901 to 903 belong to item 900
901 I 1 3994460 ENGINE AR-GENSET
902 I 1 3996905 GENERAL ARRANGEMENT
903 I 1 1441696 GENERATOR AR-PWR (A679)
1000 I 1 0V2319 DTO - 52 SQ FT ENG DRIVEN RADIATOR
This line item provides a 52 square foot engine driven radiator that provides 104F with 7F rise ambient capability at 1000ft a.s.l. and 0.5" of water external static.
Radiator will be supplied loose for on-site installation due to the size.
Drop over Sound Attenuated Enclosure complete with exhaust system, distribution panel and lighting

CATERPILLAR CTS 1500 AMP AUTOMATIC TRANSFER SWITCH

Caterpillar Components Features

Feature Code	Qty	Description
DELATRN_I	1	DELAYED TRANSITION
STANBYP_I	1	STANDARD - NO BYPASS
CONTACT_I	1	CONTACTOR

NEMA03R_I	1	NEMA 3R ENCLOSURE
1600AMP_I	1	1600 AMPS
003POLE_I	1	3 POLES
ATS00V7_I	1	277/480V, 3 PHASE, 4 WIRE, 60H
MX00250_I	1	MX250 CONTROLLER
MCONS01_I	1	24VDC MX250 CONTROL PACKAGE
24DC0Q2_I	1	MX PK SHAVE/REMOTE TEST(24VDC)
ZNETM00_I	1	MX MODBUS COMM CARD
GNDBAR6_I	1	MX GndBus 12-#2 600M 600-4000A

CTSD00B03160E

NOTE: ALL SHIP LOOSE ITEMS TO BE INSTALLED BY OTHERS – PART OF GENSET INSTALLATION

GENERAL
Parts book and operation manual
Generator test report
0.8 factory load test

Freight is included FOB truck job site, Green Valley, AZ

Basic Packaged Generator Set Start up includes:
All work to be performed during regular business hours, 7:00 a.m. to 4:00 p.m. Monday – Friday.

- Install acid in the batteries
- Hook up batteries
- Visually inspect unit for damage or missing parts
- Check Fluid levels – install coolant in installed cooling system
- Check isolators adjustments
- Hook up auto start wires to Generator
- Verify Battery Charger is working
- Verify Block Heater is working
- Prime fuel system
- Hook up to EMCP 2+ panel verify settings are at factory default settings
- Copy Configuration of panel and give to sales department
- Service meter extend days out
- Start up unit verify operation at no-load
- Verify correct voltage and hertz
- Check Safeties
- Verify all gauges are reading correctly
- Connect and disconnect pure resistive load bank with one 75 foot run.
- Load bank for 4 hours
- Perform Startup Inspection Form and give paper work to the sales department
- Perform facility load tests
- Perform basic training session in conjunction with start-up services

Automatic Transfer Switch Start up includes: (To be performed at time of genset startup)
All work to be performed during regular business hours, 7:00 a.m. to 4:00 p.m. Monday – Friday.

- Visually inspect switch for damage or loose items
- Covers are installed and secured
- Manually transfer switch with no voltage
- Verify limit switches are working
- Verify all electrical connections are secure
- Power up switch
- Check voltages on normal and emergency circuit
- Calibrate voltage sensing
- Check phase rotation
- Record settings and timers

- Make sure generator is in auto and breaker closed
- Perform a power outage test on the transfer switch
- Time each phase of the switch functions and record
- Verify the times are the same as the settings
- Verify bypass system (by-pass switches only)
- **Perform ATS start-up in conjunction with genset start-up services**

Thank you for the opportunity to quote this project. ***Empire Power Systems*** remains at your disposal for any additional information or assistance that you may require.

Best regards,

Empire Power Systems

Steve Maddox

Steve Maddox, Account Manager
Direct: (520) 407-3106 - Fax: (520) 407-3153 - Cell: (520) 955-3106 - Email: smaddox@empire-cat.com

This Quote Specifically Excludes:

- Any applicable Taxes
- Installation, electrical, mechanical, permits, and engineering
- Crane or Rigging at Job Site

Subject to the attached terms and conditions. This quote automatically expires 11/30/2014.

TERMS & CONDITIONS

A) Customer is responsible for any and all installation of the equipment supplied by **Empire Power Systems**, unless otherwise specified in writing. All equipment needed to perform any loading or unloading of the equipment supplied by **Empire Power Systems** is the responsibility of the buyer.

B) Empire Power Systems limits the scope of supply for this quotation to the equipment and services listed in our bill of material. Unless specifically listed in our bill of material, equipment not indicated is assumed to be supplied by others. We have detailed the equipment proposed in the bill of material. Please check it to be certain that it meets your requirements.

C) Empire Power Systems reserves the right to correct any errors or omissions. Standard warranty of the manufacturer applies. Copies are available upon request.

D) Contracts which include penalty or liquidated damage clauses, waivers of subrogation, or naming a third party additionally insured are not acceptable or binding on **Empire Power Systems**, unless accepted and confirmed in writing by an officer of **Empire Power Systems** at its Phoenix division office.

E) Unless agreed to in writing, **Empire Power Systems** will not accept purchase orders which:

- Require Empire Power Systems to pay any and all legal expenses for the purchaser in the event of a dispute
- Require that Empire Power Systems be responsible for design work and/or guarantee that a performance standard for a system be met
- Require completion and acceptance of the project by the owner before payment

F) There will be a **25%** of order cancellation fee for any orders cancelled, once placed and accepted by **Empire Power Systems**.

G) Empire Power Systems' standard and extended terms and conditions are included in the quotation and hereby become part of this quotation. These same terms need to be noted on any purchase order received by **Empire Power Systems** in order to process your order.

H) Empire Power Systems will not be responsible for any labor or material charges by others associated with the start-up and installation of this equipment unless previously agreed upon, in writing by **Empire Power Systems**.

I) Empire Power Systems is a supplier of materials and related services and not a contractor. Retention is not acceptable.

J) Credit is subject to **Empire Power Systems,** approval at its sole discretion. This quote in no way constitutes approval of credit.

K) Empire Southwest LLC has entered a like-kind exchange (LKE) program. If the equipment described herein qualifies and is purchased, notice is hereby given that **Empire Southwest LLC** will assign its rights under the sales contract to **Empire Exchange LLC** including, if applicable, the right to purchase any trade-in property. If this contract is assigned to **Empire Exchange LLC** sales proceeds must be remitted according to the invoice rendered.

L) Sales payments are due Net 10; all others Net 30. Unless otherwise agreed in writing by a corporate officer of Empire Southwest, LLC ("Empire"), the purchase of goods (including, but not limited to, new and used equipment, attachments, parts and technology) or services from Empire will be governed solely by Empire's Terms and Conditions of Sales and Service (the "Terms"), which are available at www.empire-cat.com/termsandconditions or such other successor website at which Empire posts its Terms from time to time. A hard copy of the Terms is available upon written request to terms.conditions@empire-cat.com. Empire's Terms are hereby incorporated by reference into this document and all other documents related to your purchase of goods or services from Empire. By purchasing goods or services from Empire, you agree to be bound by Empire's Terms.

Terms and conditions of this quotation govern over any conflict between this document and customer's purchase order or other document.

Proposal / Submittal Attachment
Emissions Compliance Section

The generator engine supplied specific to this project is labeled, **EPA Stationary Emergency.**

- The engine configuration supplied meets USA Environmental Protection Agency, (EPA) Stationary Emergency Certifications established January 1, 2011 for Stationary Use Only during Defined Emergency Conditions.

The engine is EPA certified to the following operating conditions:

- Normal source power is lost.
- User starts the emergency generator set to supply power to the electrical loads.
- Normal source power returns.
- User shuts down the emergency generator set and supplies the electrical loads from the normal source.

The engine is **not** certified to the following operational conditions:

- Non-emergency operation.
- Prime Power applications.
- Load management / peak shaving applications.
- Electric Power Rental and other mobile units.
- Installations which run for storm avoidance.

There is no restriction on the number of hours that an emergency installation may run under true emergency conditions, but the EPA regulation only allows operators to run their emergency gen sets for 100 hours per year for maintenance and exercise purposes. However if local regulations dictate, operators may petition the EPA for an increased number of annual maintenance hours. All operation of an emergency generator set must be recorded by the operator and referenced to a non-resettable hour meter fitted to the generator set. New emergency engines built after the

effective date of the tier 4 regulations for their power class, must also be fitted with a permanent label stating that they are for emergency use only.

Image shown may not reflect actual package

SUB BASE FUEL TANK for C27 and C32 ENCLOSURE

Diesel Generator Set

Dual Wall sub base fuel tanks offer an integrated fuel solution for your Cat® diesel generator set.

FEATURES

- UL 142 (US) and ULC S601 (Canada) Listed
- NFPA 30, 37 and 110 installation compliant
- CSA C282-09 and B139-04 installation compliant
- Dual wall, secondary containment (minimum of 110% of primary tank capacity)
- Tank design provides capacity for thermal expansion of fuel
- Direct reading fuel level gauge
- Fuel supply dip tube is positioned so as not to pick up fuel sediment
- Fuel return and supply dip tubes are separated by an internal baffle to prevent recirculation of heated return fuel
- Fuel fill – 101.6 mm (4 in), lockable flip top cap
- Primary tank level detection switch in containment basin
- Primary and secondary tanks are leak tested at 20.7 kPa (3 psi) minimum
- Interior tank surfaces coated with a solvent-based thin-film rust preventative
- Heavy gauge steel gussets suitable for lifting package
- Gloss black polyester alkyd acrylic enamel exterior paint over epoxy based primer
- Primary tanks are equipped with customer connections for remote fuel transfer, return, and vent. Additional ports provided for customer use.
- 2" Atmospheric screened vent cap
- Lockable 2" raised fuel fill with optional seven gallon spill containment
- Leak detection switch
- Port for access to containment tank
- Removable engine supply and return dip tubes
- Fittings for opt fuel levels or auxiliary fuel pump
- Excellent stub-up access beneath circuit breaker (within fuel tank)
- Emergency vents on primary and secondary tanks are sized in accordance with NFPA 30, external to enclosure.
- Compatible with factory enclosures only
- Optional installed fuel level indication at the generator set control panel.
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- Tested and analyzed in accordance with: ASCE 7-98, ASCE 7-02, ASCE 7-05, ICC-ES AC-156
- Anchoring details are site specific, and are dependant on many factors such as generator set size, weight, and concrete strength. IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer.

ATTACHMENTS

Rating			Engine	Strategy	Run Time @ 100% Load (Hrs)		
ekW	kVA	SB/PP/CN			1000 gal	2000 gal	3600 gal
1000	1250	SB	C32	Low BSFC	14.4	28.8	51.9
910	1138	PP	C32	Low BSFC	15.9	31.7	57.1
830	1038	CN	C32	Low BSFC	17.4	34.7	62.5
800	1000	SB	C27	Low BSFC	17.8	35.5	63.9
725	906	PP	C27	Low BSFC	19.3	38.6	69.5
750	938	SB	C27	Low BSFC	18.9	37.8	68.1
680	850	PP	C27	Low BSFC	20.7	41.3	74.4

Rating			Engine	Strategy	Run Time @ 100% Load (Hrs)		
ekW	kVA	SB/PP/CN			1000 gal	2000 gal	3600 gal
1000	1250	SB	C32	ESE (Tier 2)	13.9	27.8	50.1
910	1138	PP	C32	ESE (Tier 2)	15.2	30.4	54.8
830	1038	CN	C32	ESE (Tier 2)	16.3	32.6	58.7
800	1000	SB	C27	ESE (Tier 2)	17.5	34.9	62.8
725	906	PP	C27	ESE (Tier 2)	19.0	38.0	68.3
750	938	SB	C27	ESE (Tier 2)	18.7	37.3	67.2
680	850	PP	C27	ESE (Tier 2)	20.2	40.4	72.7

Rating			Engine	Strategy	Run Time @ 100% Load (Hrs)		
ekW	kVA	SB/PP/CN			1000 gal	2000 gal	3600 gal
800	640	SB	C27	Tier 4 Interim	17.0	34.0	61.1
725	580	PP	C27	Tier 4 Interim	18.8	37.6	67.7

DIESEL GENERATOR SET

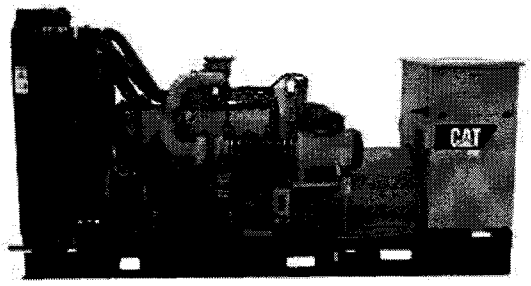


Image shown may not reflect actual package.

STANDBY
800 ekW 1000 kVA
60 Hz 1800rpm 480 Volts

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

FEATURES

FUEL/EMISSIONS STRATEGY
- EPA Certified for Stationary Emergency Application (EPA Tier 2 emissions levels)

DESIGN CRITERIA
- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

UL 2200/ CSA - Optional
- UL 2200 listed packages
- CSA Certified

Certain restrictions may apply. Consult with your Cat® Dealer.

FULL RANGE OF ATTACHMENTS
- Wide range of bolt-on system expansion attachments, factory designed and tested
- Flexible packaging options for easy and cost effective installation

SINGLE-SOURCE SUPPLIER
- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT
- Cat dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- The Cat S•O•S℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

CAT C27 ATAAC DIESEL ENGINE
- Utilizes ACERT™ Technology
- Reliable, rugged, durable design
- Four-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

CAT GENERATOR
- Designed to match the performance and output characteristics of Cat diesel engines
- Single point access to accessory connections
- UL 1446 recognized Class H insulation

CAT EMCP 4 CONTROL PANELS
- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

SEISMIC CERTIFICATION
- Seismic Certification available
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength. IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer
- Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- Pre-approved by OSHPD and carries an OSP-0084-10 for use in healthcare projects in California

STANDBY 800 ekW 1000 kVA

60 Hz 1800rpm 480Volts

FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	• Air cleaner	
Cooling	• Package mounted radiator	
Exhaust	• Exhaust flange outlet	[ ] Exhaust mufflers
Fuel	• Primary fuel filter with integral water separator • Secondary fuel filters • Fuel priming pump	
Generator	• Matched to the performance and output characteristics of Cat engines	[ ] Oversize and premium generators [ ] Permanent magnet excitation (PMG) [ ] Internal excited (IE) [ ] Anti-condensation space heaters
Power Termination	• Bus bar	[ ] Circuit breakers, UL listed [ ] Circuit breakers, IEC compliant
Control Panel	• EMCP 4 Genset Controller	[ ] EMCP 4.2 [ ] EMCP 4.3 [ ] EMCP 4.4 [ ] Generator temperature monitoring and protection [ ] Load share module [ ] Digital I/O module [ ] Remote monitoring software
Mounting		[ ] Rubber vibration isolators
Starting/Charging		[ ] Battery chargers [ ] Oversize batteries [ ] Jacket water heater [ ] Heavy duty starting system [ ] Charging alternator
General	• Paint - Caterpillar Yellow except rails and radiators gloss black	The following options are based on regional and product configuration: [ ] Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007 [ ] EU Certificate of Conformance (CE) [ ] UL 2200 package [ ] CSA Certification [ ] EEC Declaration of Conformity [ ] Enclosures- sound attenuated, weather protective [ ] Automatic transfer switches (ATS) [ ] Integral & sub-base fuel tanks [ ] Integral & sub-base UL listed dual wall fuel tanks

STANDBY 800 ekW 1000 kVA

60 Hz 1800rpm 480 Volts

SPECIFICATIONS

CAT GENERATOR

Frame size 1268
Excitation ..... Permanent Magnet
Pitch 0.6667
Number of poles 4
Number of bearings ..... Single bearing
Number of Leads 012
Insulation ..... UL 1446 Recognized Class H with tropicalization and antiabrasion
- Consult your Caterpillar dealer for available voltages

IP Rating ..... Drip Proof IP23
Alignment ..... Pilot Shaft
Overspeed capability 150
Wave form Deviation (Line to Line) ..... Less than 5% deviation
Voltage regulator..... ..... 3 Phase sensing with selectible volts/Hz
Voltage regulation ..... Less than +/- 1/2% (steady state)
Less than +/- 1% (no load to full load)

CAT DIESEL ENGINE

C27 TA, V-12, 4-Stroke Water-cooled Diesel
Bore ..... 137.20 mm (5.4 in)
Stroke ..... 152.40 mm (6.0 in)
Displacement ..... 27.03 L (1649.47 in^3)
Compression Ratio 16.5:1
Aspiration ..... TA
Fuel System ..... MEUI
Governor Type ..... ADEM™ A4

CAT EMCP 4 SERIES CONTROLS

EMCP 4 controls including:
- Run / Auto / Stop Control
- Speed and Voltage Adjust
- Engine Cycle Crank
- 24-volt DC operation
- Environmental sealed front face
- Text alarm/event descriptions

Digital indication for:
- RPM
- DC volts
- Operating hours
- Oil pressure (psi, kPa or bar)
- Coolant temperature
- Volts (L-L & L-N), frequency (Hz)
- Amps (per phase & average)
- ekW, kVA, kVAR, kW-hr, %kW, PF

Warning/shutdown with common LED indication of:
- Low oil pressure
- High coolant temperature
- Overspeed
- Emergency stop
- Failure to start (overcrank)
- Low coolant temperature
- Low coolant level

Programmable protective relaying functions:
- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under Frequency (81 o/u)
- Reverse Power (kW) (32)
- Reverse reactive power (kVAr) (32RV)
- Overcurrent (50/51)

Communications:
- Six digital inputs (4.2 only)
- Four relay outputs (Form A)
- Two relay outputs (Form C)
- Two digital outputs
- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- Emergency stop pushbutton

Compatible with the following:
- Digital I/O module
- Local Annunciator
- Remote CAN annunciator
- Remote serial annunciator

STANDBY 800 ekW 1000 kVA

60 Hz 1800rpm 480 Volts

TECHNICAL DATA

Open Generator Set - - 1800rpm/60 Hz/480 Volts	DM7696	
EPA Certified for Stationary Emergency Application (EPA Tier 2 emissions levels)		
Generator Set Package Performance		
Genset Power rating @ 0.8 pf	1000 kVA	
Genset Power rating with fan	800 ekW	
Fuel Consumption		
100% load with fan	216.9 L/hr	57.3 Gal/hr
75% load with fan	171.7 L/hr	45.4 Gal/hr
50% load with fan	122.3 L/hr	32.3 Gal/hr
Cooling System[1]		
Air flow restriction (system)	0.12 kPa	0.48 in. water
Engine coolant capacity	55.0 L	14.5 gal
Inlet Air		
Combustion air inlet flow rate	62.8 m^3/min	2217.8 cfm
Exhaust System		
Exhaust stack gas temperature	511.4 °C	952.5 °F
Exhaust gas flow rate	170.3 m^3/min	6014.1 cfm
Exhaust flange size (internal diameter)	203 mm	8 in
Exhaust system backpressure (maximum allowable)	10.0 kPa	40.2 in. water
Heat Rejection		
Heat rejection to coolant (total)	330 kW	18767 Btu/min
Heat rejection to exhaust (total)	796 kW	45268 Btu/min
Heat rejection to aftercooler	162 kW	9213 Btu/min
Heat rejection to atmosphere from engine	110 kW	6256 Btu/min
Heat rejection to atmosphere from generator	40.3 kW	2293.9 Btu/min
Alternator[2]		
Motor starting capability @ 30% voltage dip	3641 skVA	
Frame	1268	
Temperature Rise	125 °C	225 °F
Lube System		
Sump refill with filter	68.0 L	18.0 gal
Emissions (Nominal)[3]		
NOx g/hp-hr	5.18 g/hp-hr	
CO g/hp-hr	.23 g/hp-hr	
HC g/hp-hr	.03 g/hp-hr	
PM g/hp-hr	.024 g/hp-hr	

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.

[2] Generator temperature rise is based on a 40°C ambient per NEMA MG1-32. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics.

[3] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77°F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

STANDBY 800 ekW 1000 kVA

60 Hz 1800rpm 480Volts

RATING DEFINITIONS AND CONDITIONS

Applicable Codes and Standards: AS1359, CSA C22.2 No 100-04, UL142, UL489, UL601, UL869, UL2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, 72/23/EEC, 98/37/EC, 2004/108/EC

Standby - Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

Fuel Rates are based on fuel oil of 35° API (16° C or 60° F) gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.).

STANDBY 800 ekW 1000 kVA

60 Hz 1800rpm 480Volts

DIMENSIONS

Package Dimensions		
Length	4141.6 mm	163.05 in
Width	1823.3 mm	71.78 in
Height	2210.5 mm	87.03 in

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions.

Feature Code: C27DR70

Gen. Arr. Number: 385-0624

Source: U.S. Sourced

LEHE0452-00 (08/13)

www.Cat-ElectricPower.com

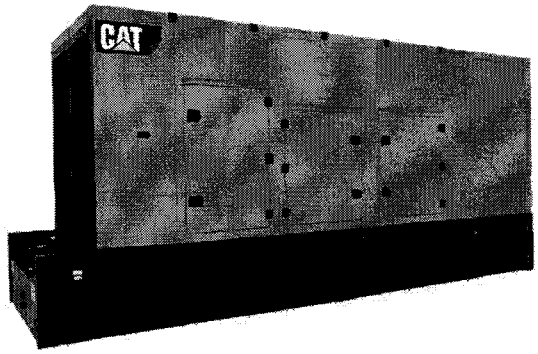


Image shown may not reflect actual package

SOUND ATTENUATED ENCLOSURES FOR C27 and C32 GENERATOR SETS

These sound attenuated, factory installed enclosures are designed for safety and aesthetic value. Rugged construction provides weather protection and the ability to withstand exposure to the elements.

FEATURES

ROBUST/HIGHLY CORROSION RESISTANT CONSTRUCTION

- Environmentally friendly, polyester powder baked paint in Caterpillar yellow.
- Zinc plated or stainless steel fasteners
- 14 gauge steel construction
- Pitched roof for improved rain ingress protection
- Critical grade internally mounted muffler/exhaust system
- Vibration spring isolators
- 75 dBA at 7m

EXCELLENT ACCESS

- Control panel mounted on left side or right side of package
- Large cable entry area for ease of installation
- Left hand or right hand bottom entry access to power cable bus or circuit breaker
- Double doors on both sides
- Lube oil and coolant drains piped to exterior of enclosure and terminated drain valves

OPTIONS

- Interior AC lighting system and AC receptacles (interior and exterior)
- AC distribution box
- Interior DC lighting system with automatic shutoff timer
- Cold weather bundle, including motorized louvers (powered closed), back draft dampers and enclosure space heater
- Yellow (default), white, grey, or beige paint
- 1000 gal., 2000 gal., 3600 gal. fuel tanks
- 120 mph wind loading

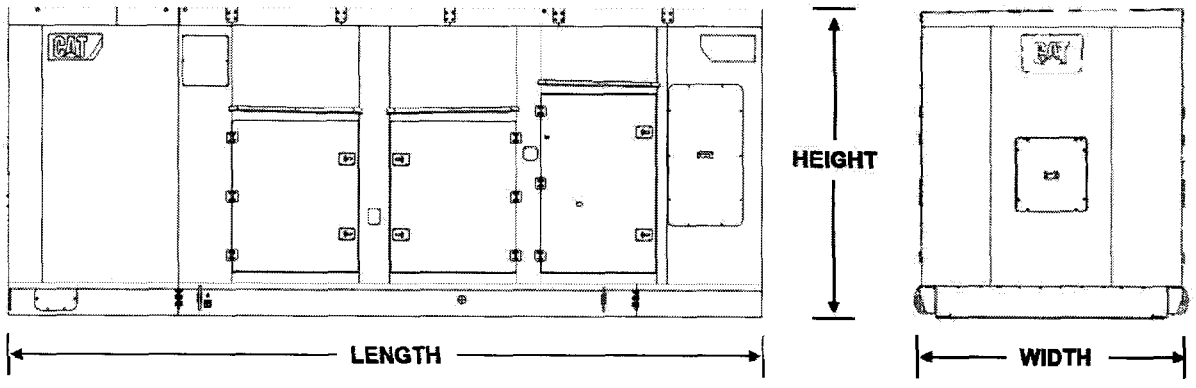
SECURITY AND SAFETY

- Lockable access doors with standard key utilization
- Cooling fan and battery charging alternator fully guarded
- Oil fill and battery can only be reached via lockable access
- External fuel connections.
- Externally mounted emergency stop button
- Designed for spreader-bar lifting to ensure safety

Certifications

- UL Listed
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012 CBC 2007
- IBC certifiable for 120 mph wind loading
- Tested and analyzed in accordance with: ASCE 7-98, ASCE 7-02, ASCE 7-05, ICC-ES AC-156

ENCLOSURES



Note: For reference only – do not use for installation design. Please contact your dealer for exact weights and dimensions.

ENCLOSURE WEIGHTS AND DIMENSIONS

	Length		Width		Height		Weight*	
	mm	in	mm	in	mm	in	kg	lbs.
Enclosure with sub base	7,010.4	276.0	2,554.1	100.6	2,844.4	112.0	3,500.0	7,716.2
Enclosure with 1000 gal tank base	7,645.4	301.0	2,554.1	100.6	3,213.1	126.5	5,920.0	13,051.4
Enclosure with 2000 gal tank base	7,645.4	301.0	2,554.1	100.6	3,454.4	136.0	6,050.0	13,338.0
Enclosure with 3600 gal tank	9,750.0	383.9	2,554.1	100.6	3,758.8	148.0	7,000.0	15,432.4

*Weight does not include package generator set weight.

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions.